PROPOSED POLICY FOR

MANAGEMENT OF EXCESS SOIL,

ROCK AND LIKE MATERIALS

Technical Consultation Document

Prepared by Materials Management Policy Committee

Ontario Ministry of the Environment

August, 1992

Acknowledgements

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for editing final report and to Rose-Marie Gonsalves
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EXECUTIVE SUMMARY

The Ministry of the Environment (MOE) is proposing changes to Regulation 309 under Part V of the *Environmental Protection Act*, regarding the management of wastes, in particular excess soil, rock and similar materials. The ministry is seeking comment on the proposed policy before it is finalized.

BACKGROUND

Under the *Environmental Protection Act* (*EPA*) and Regulation 309, some wastes are designated into categories; the categories are then exempted from the disposal requirements of the act and regulation. Inert fill is the category of exempted waste which is most relevant to the management of excess soil, rock and similar materials. Inert fill is defined in the regulation as "earth, rock fill or waste of a similar nature that contains no putrescible materials or soluble or decomposable chemical substances" - that is, earth, rock or waste of a similar nature that has nothing in it which will rot, such as foodstuffs, and which contains no chemical substances which are soluble or which could decompose.

The amount of excess material that actually conforms to this definition of inert fill is very limited. As a result, large quantities of materials have been managed as waste and disposed of at landfill sites approved under Part V of the *Environmental Protection Act*. Not all these wastes pose environmental or health risks which require this degree of control.

In addition to Regulation 309, the ministry has developed a number of guidelines concerning the management of excess materials. These guidelines have been developed predominantly for application to specific materials or in specific situations. Because they are not integrated, uniform application of the guidelines is difficult. Furthermore, there are no guidelines available for some contaminants.

As well, municipal landfill sites, particularly in the Greater Toronto Area, face severe capacity limitations. Many municipalities operating these sites have restricted or banned excavated soils. This has meant serious problems for those who need to dispose of excess soil, for instance those in the construction sector, or utility contractors. Limiting the amount of materials which must be disposed of at these highly engineered sites would extend the operating life of the sites. Also, it is consistent with MOE goals to divert wastes from municipal landfill sites by providing for alternative disposal. And increasing the range of disposal options should help curb illegal dumping.

Finally, integration of the various guidelines would streamline the management process for rock, soil and similar materials, eliminating current inconsistencies in the procedures.

PURPOSE OF THE POLICY

The purposes of the policy are to deal with excess materials in a consistent and appropriate way that does not pose a risk to human or environmental health, is economical and does not strain landfill site resources. The approach will be consistent with the overall waste management framework provided by Regulation 309 under the *Environmental Protection Act*. The policy is designed to protect human health and the environment by ensuring the quality of existing soil with safeguards against contaminated fill being improperly imported and deposited.

In summary, the proposed policy is intended to:

- clearly establish the order in which decisions are to be made to manage excess materials;
- outline the process for categorizing these materials; and
- expand the options for managing them.

OVERVIEW OF POLICY

To meet the requirements of the proposed policy, the generator or receiver of an excess material would be required to:

1) **Determine if the material should be managed under the proposed policy.** For example, managing materials through 3R's -- reduction, reuse and recycling -- is always preferred. Other materials are excluded from the policy due to their chemical or physical characteristics and therefore their potential to cause undesirable effects if managed as fill material. Figure 3 illustrates the decisions to be made to determine if a material should be managed under the policy.

2) **Categorize the material.** The policy contains four new material categories, including a redefined fill category. Chemical sampling and analysis may be required to classify materials (Figures 1 and 2).

3) **Determine the approporiate management option.** The appropriate option depends on the material classification, which in turn depends on the degree of contamination (Figures 1 and 2).

4) **Follow approvals process requirements.** The disposal of each class of material has a different set of approvals. These are described in detail in Section 4 of the main body of this report.

Chemical Classification Guidelines

As part of the development of the policy, a number of guidelines for chemical classification have been produced. These are discussed in Section 3 of the main body of this report.

Some of these guidelines are based on extensive background soil sampling carried out throughout Ontario. Additional guidelines from three other sources also are proposed in the policy; these guidelines are based on existing MOE numbers determined by demonstrated adverse health effects, on a review of guidelines available from other Canadian and international jurisdictions and on professional judgment.

A complete description of the protocols and rationale describing the guideline development process is available, entitled Rationale for the Development and Application of Bulk Chemical Soil Placement Guidelines for Management of Excess Soils, Rocks and Like Materials.

Approvals Process

The approvals process includes a proposed permit-by-rule procedure through which the responsibility to properly manage the urban residential and urban industrial fill categories is delegated to those who generate and those who receive wastes. This new approach for the ministry will streamline the approvals process by removing the requirement for Certificates of Approval for urban residential and urban industrial fill sites. MOE's responsibilities will be in monitoring and enforcing the rules governing the placement of soil at these sites, rules which will be explicitly set out in the revised regulation.

However, controlled fill sites will require Certificates of Approval, issued under part V of the EPA. The soil, rock, or similar materials which may be disposed of as controlled fill may not contain rotting or decomposable materials; consequently they will not create landfill gas problems, will not attract scavenging birds and animals, and will not cause foul odors, thus eliminating many of the objectionable features of municipal landfills. As well, since the material deposited must be like rock or soil, controlled fill sites should be more attractive visually. Finally, controlled fill sites will be less contaminated than municipal landfill sites.

Inert fill material does not require approval for its disposal under this policy. Other approvals such as compliance with municipal by-laws, restrictions on filling from the local conservation authority, and provisions of MOE's Lakefilling Guidelines is still required.

LINKAGES WITH OTHER MOE POLICY INITIATIVES

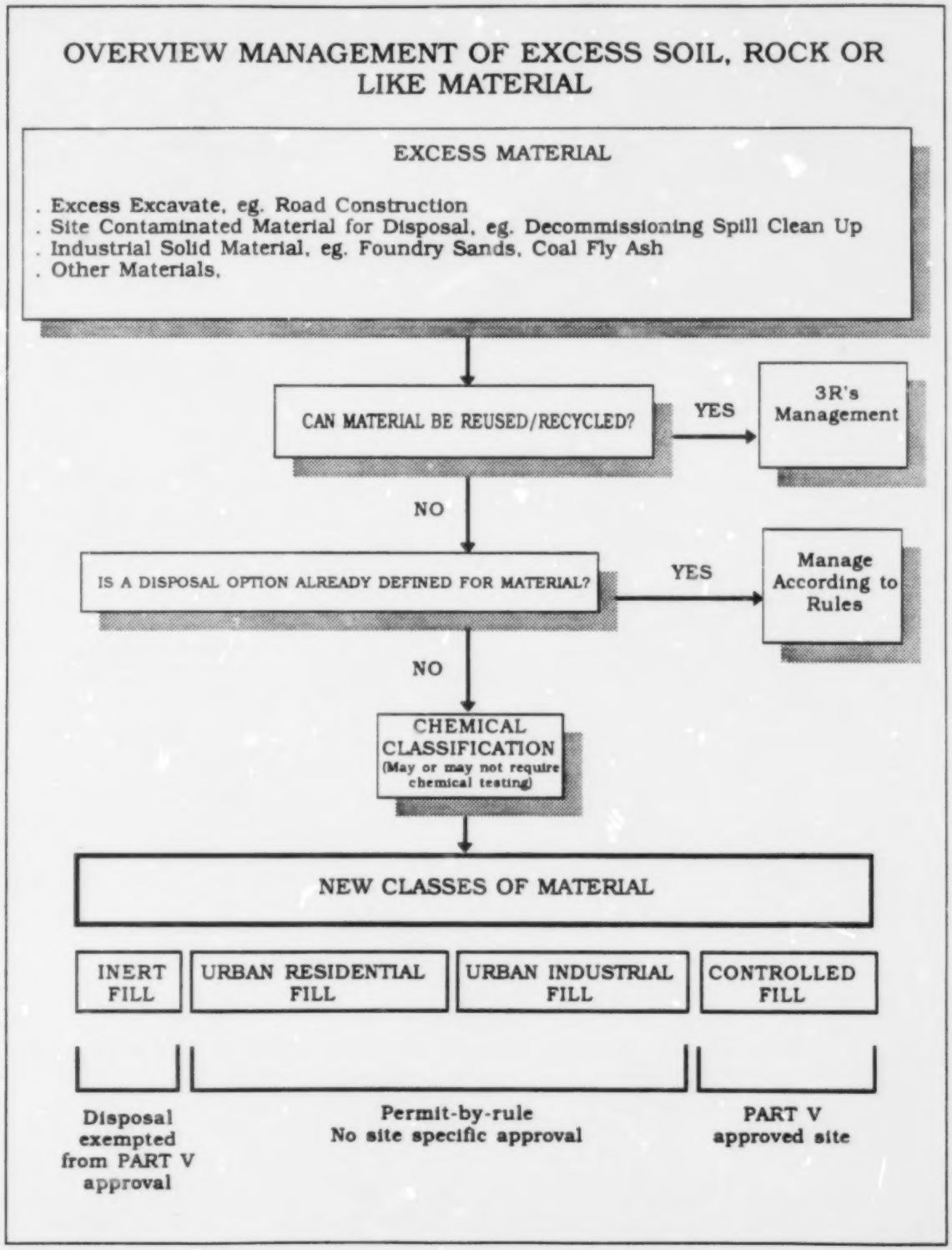
The proposed policy will provide a framework which will integrate the management of excess materials with the interim guidelines for Fill Quality for Lakefilling and the Decommissioning Policy and Guidelines for Industrial Sites in Ontario.

Numerous other MOE policy guidelines that have been developed for soils, sludge, site-specific decommissioning, etc. will be reviewed when this policy has been finalized.

ECONOMIC IMPACTS

An extensive evaluation of the potential economic impacts of the proposed policy on the regulated sectors has been prepared. The analysis predicts province-wide savings as result of the proposed policy, primarily through lower tipping or dumping fees and decreases in distances materials have to be hauled.

FIGURE 1


OVERVIEW MANAGEMENT OF EXCESS SOIL, ROCK OR LIKE MATERIAL
EXCESS MATERIAL
. Excess Excavate, eg. Road Construction
. Site Contaminated Material for Disposal, eg. Decommissioning Spill Clean Up
. Industrial Solid Material, eg. Foundry Sands, Coal Fly Ash
. Other Materials.
CAN MATERIAL BE REUSED/RECYCLED?
YES
3R's Management
NO
IS A DISPOSAL OPTION ALREADY DEFINED FOR MATERIAL?
YES
Manage According to Rules
NO
CHEMICAL CLASSIFICATION
(May or may not require chemical testing)
NEW CLASSES OF MATERIAL
INERT FILL
URBAN RESIDENTIAL FILL
URBAN INDUSTRIAL FILL
CONTROLLED FILL
Disposal exempted from PART V approval
Permit-by-rule
No site specific approval
PART V approved site

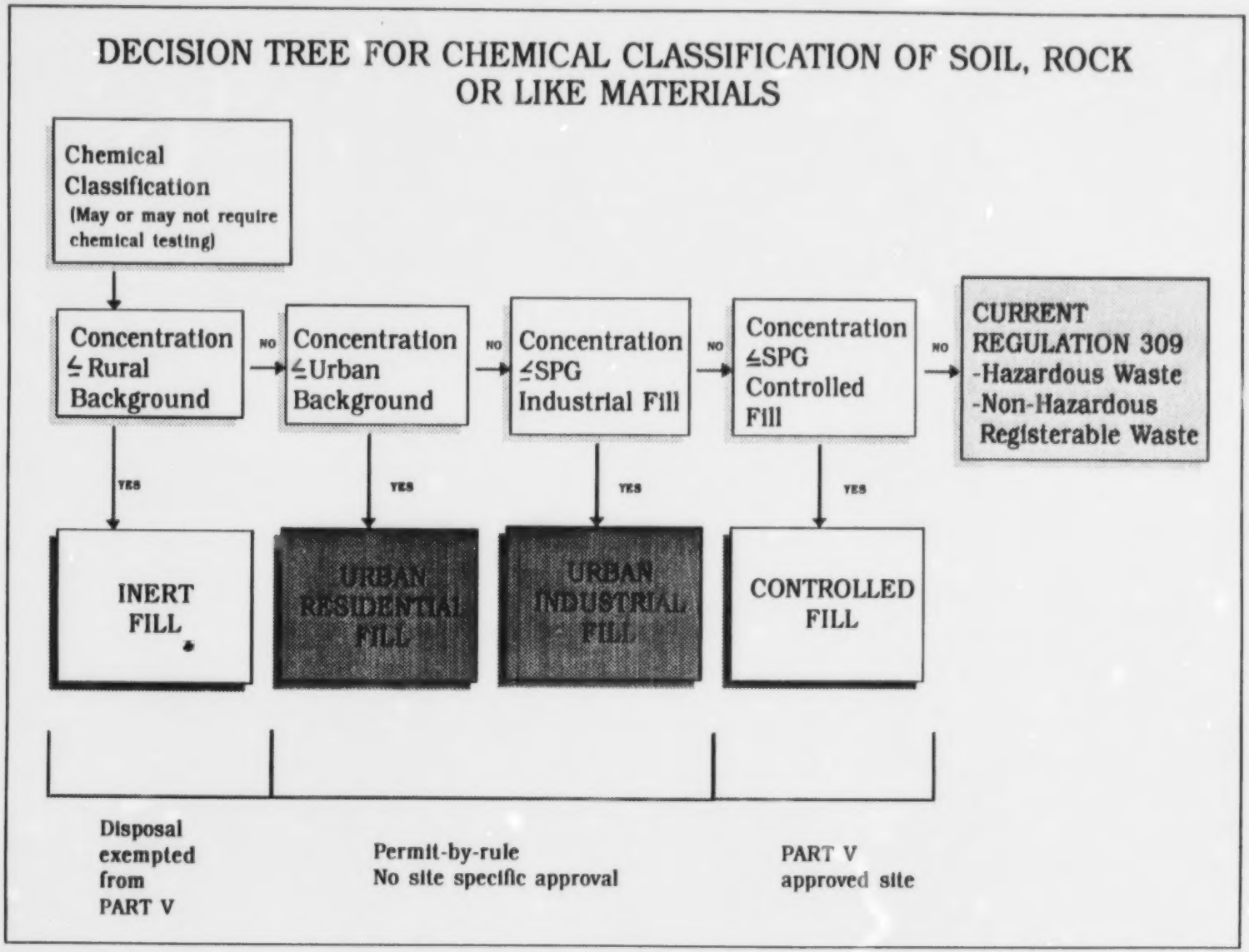
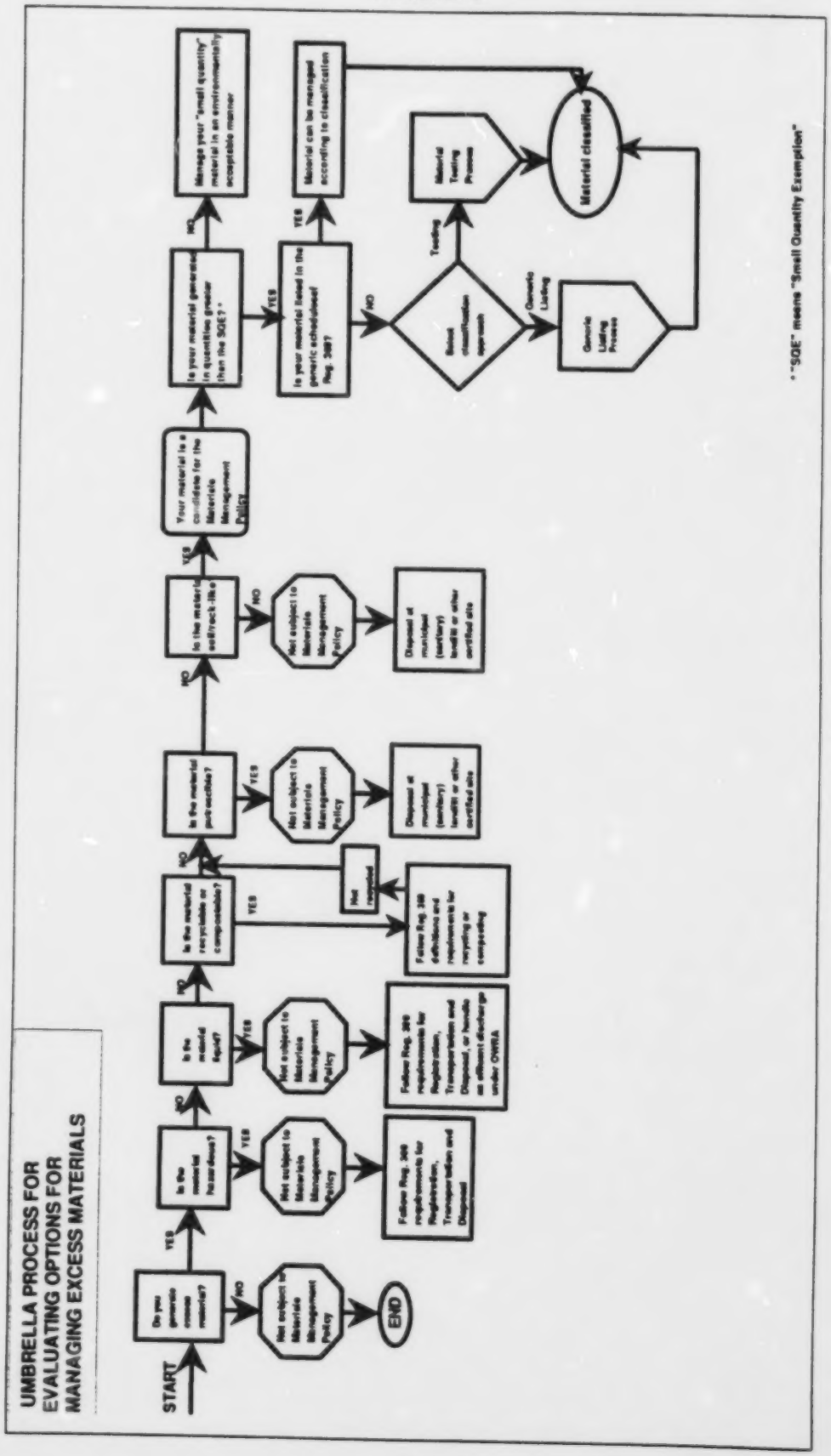

DECISION TREE FOR CHEMICAL CLASSIFICATION OF SOIL, ROCK OR LIKE MATERIALS
Chemical Classification
(May or may not require chemical testing)
Concentration ≤ Rural Background
NO
Concentration ≤ Urban Background
NO
Concentration ≤ SPG Industrial Fill
NO
Concentration ≤ SPG Controlled Fill
NO
CURRENT REGULATION 309
-Hazardous Waste
-Non-Hazardous Registerable Waste
YES
YES
YES
YES
INERT FILL
URBAN RESIDENTIAL FILL
URBAN INDUSTRIAL FILL
CONTROLLED FILL
Disposal exempted from PART V
Permit-by-rule
No site specific approval
PART V
approved site

FIGURE 2

(x)

FIGURE 3


UMBRELLA PROCESS FOR EVALUATING OPTIONS FOR MANAGING EXCESS MATERIALS
START
Do you generate excess material?
NO
Not subject to Materials Management Policy
END
YES
Is the material hazardous?
YES
Not subject to Materials Management Policy
Follow Reg. 340 requirements for Registration, Transportation and Disposal
NO
Is the material liquid?
YES
Not subject to Materials Management Policy
Follow Reg. 340 requirements for Registration, Transportation and Disposal, or handle as effluent discharge under OWRA
NO
Is the material recyclable or compostable?
YES
Not subject to Materials Management Policy
Follow Reg. 340 definitions and requirements for recycling or composting
NO
Is the material putrescible?
YES
Not subject to Materials Management Policy
Disposal at municipal (sanitary) landfill or other certified site
NO
Is the material solid/rock-like
NO
Not subject to Materials Management Policy
Disposal at municipal (sanitary) landfill or other certified site
YES
Your material is a candidate for the Materials Management Policy
Is your material generated in quantities greater than the SQE? *
YES
Is your material listed in the generic schedules? Reg. 347
NO
Select classification approach
Testing
Material Testing Process
Generic Listing
Generic Listing Process
YES
Material can be managed according to classification
NO
Manage your "small quantity" material in an environmentally acceptable manner
Material classified
* "SQE" means "Small Quantity Exemption"

DETAILED POLICY DESCRIPTION

1 BACKGROUND

The Ministry of the Environment (MOE) currently regulates the handling and disposal of waste through Part V of the *Environmental Protection Act (EPA)*, and Regulation 309 under the act. Some of the wastes defined in Regulation 309 include hazardous waste, liquid industrial waste, commercial wastes and domestic waste.

The wastes commonly referred to as "municipal waste" are not specifically defined as a waste category in the regulation. In practice, however, municipal waste includes commercial waste, domestic waste, and non-hazardous registerable solid waste which is accepted for disposal at municipal waste management sites.

Some wastes are designated and then exempted from the disposal requirements of the act and regulations. **Inert fill** is the category of exempted waste which is most relevant to the management of excess soil, rock and similar or like materials. Inert fill is defined as "earth or rock fill or waste of a similar nature that contains no putrescible materials or soluble or decomposable chemical substances".

The amount of excess material that actually conforms to this definition of inert fill in Regulation 309 under the *EPA* is very limited. As a result, large quantities of excess materials are considered to be waste and require disposal at landfill sites approved under Part V of the *EPA*. Not all these so-called wastes pose environmental or human health risks which require this degree of control.

In addition to Regulation 309, the ministry has developed a number of guidelines concerning the management of excess materials. These guidelines have been developed predominantly for application to specific materials or in specific situations. They are not integrated, which makes uniform application difficult. Another complication is the fact there are some contaminants which are not covered by guidelines presently available.

A further problem is that municipal landfill sites, particularly in the Greater Toronto Area, face severe capacity limitations. Many municipalities operating these sites have restricted or banned excavated soils, resulting in serious problems for generators or those who have to dispose of excess materials. Illegal dumping problems have been increasing. Limiting the amount of materials which do not need to be deposited at these highly engineered sites would extend the operating life of the sites. It is also consistent with MOE goals to divert waste from municipal landfill sites by providing for alternative management options.

Integration of the various guidelines would eliminate inconsistencies and streamline the management process for soil, rock and similar materials.

MOE has developed a draft Materials Management Policy (MMP) and has proposed revisions to Regulation 309 under the *EPA* to update and streamline disposal options for excess soil, rock and similar material.

2 PURPOSE AND OBJECTIVES OF THE POLICY

2.1 Purpose

The policy will provide a consistent approach towards the management of excess soil, rock and similar materials within the overall waste management framework provide by Regulation 309 under the *EPA*. The policy is designed to ensure protection of human health and the environment by safeguarding the quality of existing soils through controls against contaminated fill being improperly imported and deposited.

To achieve these goals, there are three objectives of the policy:

i) to set out a process for classifying excess soil, rock and similar materials, based on the degree of chemical contamination and on potential risk to human health and the natural environment;

ii) to expand the options for managing excess soil, rock and similar materials;

iii) to clearly establish the order in which decisions are to be made in managing excess materials.

The principal components of the policy are:

i) four classes of material: (redefined "**inert fill**", and three additional new classes - "**urban residential fill**", "**urban industrial fill**" and "**controlled fill**" (Figure 1);

ii) a **classification process based on chemical characteristics** of excess soil, rock or similar materials which specifies the disposal options available (Figure 2);

iii) a **streamlined approvals processes** for urban residential fill, urban industrial fill and controlled fill sites.

An **umbrella process** for evaluating options for managing excess material has been developed and is illustrated in Figure 3. This figure sets out the decision process to be followed in classifying excess materials and in deciding on the management options available for these materials.

2.2 Chemical classification process

Classification of excess soil, rock, and similar material is based on the concentrations of their specific chemical parameters. A mandatory list of chemical parameters to be tested for has been established for excavated soils and rocks. Additional chemical compounds will be added to the mandatory minimum list, if there is the possibility of unusual chemicals being present in the soil, based on investigation of site history, land use around the site and visual inspection of the soil as it is excavated.

For soil-like and rock-like materials which are produced by industrial processes, the mandatory list can be customized, with the agreement of the Ministry, to reflect compounds expected to be present, based on knowledge of the industrial process. For example, due to the temperatures reached in cement kilns, it is known that organic compounds would not be found in cement kiln dust.

There have been no classification criteria developed for radioactive contamination which occurs in certain native soils and rocks in uranium ore-bearing areas of the province such as Elliot Lake and Bancroft, as well as in some soil-like and rock-like wastes which are not associated with the nuclear industry.

2.3 Management process for excess soil, rock and similar material

A hierarchy of disposal options and approvals processes has been developed reflecting the degree of environmental risk associated with the material requiring disposal. The cleanest material, inert fill, can be disposed of at any sites requiring fill. Conversely controlled fill, the most contaminated fill category, can only be placed in a controlled fill site which has a Certificate of Approval issued by the Ministry under Part V of the *EPA*.

A series of disposal options and approvals processes have been developed for materials requiring disposal. Except for controlled fill sites, responsibility is delegated to the generator and the receiver (the person who has excess materials to dispose of and the person who owns or operates the site where they will be deposited) to manage these materials appropriately within rules established by the ministry but without obtaining a Certificate of Approval. The ministry will retain the power to monitor and enforce these rules.

2.4 Linkage with 3Rs strategies

The ministry encourages, in order of preference, a sequence of waste management strategies, which are designed to minimize the quantities wastes requiring disposal, the least desirable option. Reduction, reuse and recycling are preferred waste management strategies.

Therefore, materials which could be managed under one of these 3Rs approaches should not be considered for chemical classification and disposal as inert or permit by rule fill under the MMP. It is proposed that these materials be classified generically as controlled fill, without chemical analysis. A specific list of these materials has been developed (see Appendix III).

It includes materials such as glass, asphalt, plastics and ceramics. If such 3Rs materials are prohibited from placement in these lower costs MMP disposal sites, then the new MMP disposal costs, expected to be lower than current disposal costs, should not discourage the use of 3Rs options.

Excess materials which contain substances which could rot or break down are not suitable for management as fill under this policy because of their potential to produce methane and other decomposition gases. The proposed chemical classification and approval processes have not been designed to provide environmental protection from these types of materials. These organic materials may be suitable for composting or, if necessary, can be disposed of as domestic and commercial wastes in municipal landfill sites. Also, materials such as drywall and scrap metal are excluded from classification as fill under the policy because they are not considered to be soil-like or rock-like.

2.5 Linkages with lakefill quality and decommissioning policies

The Materials Management Policy for excess soils, rock and similar materials is one of three major policies for managing these types of materials. The proposed Fill Quality Guidelines for Lakefilling and the Decommissioning Policy and associated Guidelines for Industrial Sites in Ontario are the other two policies; they deal with more specific materials management issues.

The **Fill Quality Guidelines for Lakefilling,** (which have been released concurrently for public review with the MMP), are intended to provide policy direction on the quality of fill which is suitable for use in lakefill projects. The guidelines use the standards for the **inert fill** classification under the MMP as the first test of acceptable fill quality. Fill which is intended to be placed directly into water is further evaluated for its suitability using the Sediment Quality Guidelines and the quality of the existing sediments at the specific lakefill site. The detailed Fill Quality Guidelines for Lakefilling and Sediment Quality Guidelines documents are available separately.

The **Decommissioning Policy and Guidelines,** published in February 1989, are to be reviewed and revised by the ministry. One aspect of the review will be to enhance the links with the Lakefilling Guidelines and the Materials Management Policy. Linkages with the current Decommissioning Policy and Guidelines and the proposed Materials Management Policy occur in the following areas:

i) the existing Decommissioning Guidelines were used in part to establish the maximum concentrations of specific chemical parameters which would be acceptable for **urban industrial fill**;

ii) implementation of the Materials Management Policy will set rules for determining the disposal options for excavated soils. However, soils contaminated above residential cleanup guideline levels would for the most part be above **urban industrial fill** criteria. Thus they would be classified as

controlled fill, municipal waste, non-hazardous registerable waste or hazardous waste, depending on the degree of contamination. For disposal, materials with any analytical results above the urban industrial fill criteria must be placed in sites which have Certificates of Approval to accept the appropriate class of material.

iii) following from ii) above, the rules established under the MMP for streamlined approval requirements for disposal of less contaminated materials may provide an incentive for generators to treat their soils to remove contaminants.

iv) fill imported to replace excavated material at a decommissioning site would have to meet the SPG criteria for acceptable fill quality based on the land use at the receiving site.

3 CHEMICAL CLASSIFICATION/SOIL PLACEMENT GUIDELINES

3.1 Approach

It is proposed that soil, rock, and similar materials be classified by bulk chemical analysis for a number of organic and inorganic parameters. The analytical results would be compared with the proposed Soil Placement Guidelines (SPG) to determine into which classification the material falls and what the disposal options are for this material. This section describes the philosophy behind the development of the guidelines, the classification process and the detailed chemical guidelines for each soil placement class.

In proposing the chemical classification guidelines, the ministry's primary purpose is to ensure that the objectives of environmental protection are consistently met. A conservative (stringent) approach has been recommended, combining the use of background-based guidelines (guidelines whose numbers are based on contaminants in existing, undisturbed soil) and, where available, effects-based guidelines (guidelines whose numbers are determined by demonstrated adverse health effects). Soil Placement Guidelines, based on soil quality found in undisturbed rural and urban sites, are intended to ensure that the quality of fill imported to a particular site is comparable to the quality of soil found at sites which have similar patterns of land use, elsewhere in the province. These background values are expected to be more restrictive than values that would be based solely on established effects on human or ecological health.

Therefore the SPG have used the following approaches:

1) **Background Concentrations** - The Ministry of the Environment conducted a soil sampling and analytical study in 1991 to determine the range of background concentrations of inorganic and organic parameters in undisturbed parkland sites throughout Ontario. Soil sampling sites were selected using information on environmental conditions at locations, with no known point source of pollution, to develop typical soil concentrations from uncontaminated land. The numbers developed

in the study are described as **Ontario Typical Range (OTR) - Rural and Urban Parkland Values**.

Concentrations of individual organic and inorganic parameters in soil vary due to the different nature of the underlying rock, for example granite or limestone produce very different soil types. Concentrations also vary due to the type of vegetation which grows on the soil and the build up of organic matter from leaves decomposing. Atmospheric deposition of chemicals carried in rain or snow, introduces them into the soil. To determine the OTR number which best describes the normal range of background concentrations of each chemical parameter, a statistical evaluation of all the readings for each chemical was done. The concentration which 98% of the samples were less than was chosen as the OTR value for that parameter.

By using this approach, the normal variations in the concentrations of a chemical substance which occur from site to site across the province will be allowed for in the OTR numbers.

2) **Laboratory Analytical Limits** - This approach was used when a background concentration of a contaminant was not measurable. In analyzing the soil samples collected from both urban and rural sites, it was found that certain chemicals, such as most pesticides, phenolic compounds and a few of the polycyclic aromatic hydrocarbons (PAHs), were not detectable. This indicated either that the chemical compound was not present in the sample or that its concentration was below the current analytical capabilities of the laboratory.

To set appropriate numerical values for these "non-detectable" chemical parameters, MOE is recommending that the SPG be set at a concentration which can be analyzed by a broad number of laboratories. Such numbers or values are described as Method Detection Limits (MDLs). These values were derived by MOE scientific staff from the Laboratory Services Branch in consultation with a number of private laboratories.

3) **Effects-Based Guidelines** - These are guidelines which have been developed to indicate the onset of adverse effects to human health and the environment. The Materials Policy Committee (MPC) conducted an extensive search for effects-based guidelines from other Canadian and international jurisdictions. For most contaminants, scientifically defensible effects-based soil guidelines have not been established.

In developing SPG guidelines for the MMP, the committee adopted Ontario's existing set of Decommissioning Guidelines for Agriculture/Residential/ Parkland, plus more recent effects-based guidelines developed by the MOE. For contaminants not covered by this limited set of guidelines, the committee considered effects-based guidelines from selected jurisdictions. These sources included: US EPA Superfund Records of Decision (ROD), Alberta Manual for Underground Storage Tanks (MUST), MOE Shell/Texaco Clean-up Guidelines and the proposed new Netherlands Soil Quality Criteria. In the case of PAHs, a few additional guideline values were established

based on an approach using information on the properties of similar chemicals. In total, 62 effects-based guidelines have been established.

A more comprehensive discussion of the guideline development process can be found in the document entitled "Rationale for the Development and Application of Bulk Chemical Soil Placement Guidelines for Management of Excess Soils, Rocks and Like Materials".

Table 3-1: Soil Placement Guidelines for Mandatory Testing List - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Inorganics				
Antimony	0.43	0.43	0.86	200
Arsenic	11	17	20	200
Barium	160	180	360	7500
Beryllium	1.1	1.1	2.2	40
Cadmium	0.71	0.84	1.7	30
Chromium VI	0.5	0.5	1	80
Chromium (total)	58	62	120	7500
Cobalt	16	17	34	400
Copper	41	65	130	1500
Lead	45	98	200	2000
Mercury	0.13	0.18	0.36	8
Molybdenum	1	1	2	50
Nickel	38	38	76	1500
Selenium	0.93	1.3	2	20
Silver	0.27	0.33	0.66	200
Vanadium	77	77	150	2000
Zinc	120	140	280	6000
E.C. (mS/cm)	0.36	0.57	0.7	2.5
S.A.R. (units)	0.7	1.4	3	25
pH (range in units)	3-10	3-10	3-10	2-12
Organics				
VOCs				
Benzene	**0.002**	**0.002**	0.004	0.5
Toluene	**0.002**	**0.002**	0.004	10
Xylene	**0.002**	**0.002**	0.004	10
Methylene Chloride (Dichloromethane)	**0.003**	**0.003**	0.006	0.1
Carbon tetrachloride	**0.002**	**0.002**	-	0.04
Trichlorofluoromethane	0.012	0.013	-	0.26
Ethylene dichloride (1,2-dichloroethane)	**0.002**	**0.002**	0.004	0.15
1,1,1-trichloroethane	0.005	0.005	0.01	40
Trichloroethylene	**0.004**	**0.004**	0.008	0.7
Tetrachloroethylene	**0.002**	**0.002**	0.004	0.8
PAHs				
Benzo(a)pyrene	**0.05**	0.81	1	10
Benzo(a)anthracene	0.05	0.69	1.4	40
Dibenz(a,h)anthracene	**0.1**	0.36	0.72	9
Benzo(g,h,i)perylene	**0.1**	0.6	1.2	40
Fluoranthene	0.14	1.6	3.2	40
Naphthalene	**0.05**	0.09	0.18	40
Phenanthrene	0.092	1.4	2.8	40
Pyrene	0.11	1.2	2.4	40
PCBs				
Total	**0.3**	**0.3**	0.6	25
Phenolics				
p-cresol	**0.1**	**0.1**	-	2
2,4-dichlorophenol	**0.1**	**0.1**	-	2
2,4,6-trichlorophenol	**0.1**	**0.1**	-	2
Pentachlorophenol	**0.1**	**0.1**	-	2

Numbers in bold indicate values are method detection limits [MDLs (i.e. OTR98 Values were below MDL, hence MDL is used)]. Refer to Section 3.1.

Table 3-1-1: Additional Soil Placement Guidelines - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Organics				
Dioxins and furans (ng TEQ/g or parts per billion)	0.005	0.005	0.01	10
VOCs				
Styrene	**0.002**	**0.002**	-	0.04
Ethylbenzene	**0.002**	**0.002**	0.004	5
Chlorbenzene	**0.002**	**0.002**	0.004	30
1,4-dichlorobenzene	**0.002**	**0.002**	0.004	30
1,2-dichlorobenzene	**0.002**	**0.002**	-	0.04
1,3-dichlorobenzene	**0.002**	**0.002**	-	0.04
Chloroform (Trichloromethane)	0.002	0.0026	0.005	20
Ethylene dibromide (1,2-dibromoethane)	0.002	0.002	0.002	0.02
Vinyl Chloride (Chloroethylene)	**0.003**	**0.003**	0.006	0.09
1,1-dichloroethylene	**0.002**	**0.002**	0.004	0.2
Trans 1,2-dichloroethylene	**0.003**	**0.003**	0.006	3.3
Chloromethane	**0.003**	**0.003**	-	0.06
Bromomethane	**0.003**	**0.003**	-	0.06
dibromochloromethane	**0.003**	**0.003**	-	0.04
Bromoform (Tribromomethane)	**0.002**	**0.002**	-	0.04
1,1-dichloroethane	**0.002**	**0.002**	-	0.04
1,1,2-trichloroethane	**0.002**	**0.002**	-	0.08
1,1,2,2-tetrachloroethane	**0.004**	**0.004**	-	0.04
1,2-dichloropropane	**0.002**	**0.002**	-	0.04
Cis-1,3-dichloropropylene	**0.002**	**0.002**	-	0.04
Trans 1,3-dichloropropylene	**0.003**	**0.003**	-	0.06
PAHs				
1-methyl napthalene	**0.05**	0.09	0.18	40
2-methyl napthalene	**0.05**	0.11	0.22	40
Anthracene	**0.05**	0.23	0.46	40
Chrysene	0.1	0.94	1.9	40
Benzo(b)fluoranthene	0.15	1.6	3.2	40
Indeno(1,2,3-cd)pyrene	**0.1**	0.46	0.92	40
1-chloronaphthalene	**0.05**	**0.05**	0.1	40
2-chloronaphthalene	**0.05**	**0.05**	0.1	40
Fluorene	**0.05**	0.14	0.28	40
Perylene	**0.05**	0.37	0.74	40
Acenaphthene	**0.05**	0.16	0.32	40
5-nitro acenaphthene	**0.05**	**0.05**	0.1	40
Acenaphthylene	0.093	0.096	0.19	40
Indole	0.1	0.1	-	2
Camphene	**0.05**	0.054	-	1.1

Table 3-1-1: Additional Soil Placement Guidelines - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Phenolics				
2,4-dinitrophenol	**0.2**	**0.2**	-	4
Phenol	**0.1**	**0.1**	-	2
m-cresol	**0.1**	**0.1**	-	2
o-cresol	**0.1**	**0.1**	-	2
2,4-dimethylphenol	**0.2**	**0.2**	-	4
4-nitrophenol	**0.2**	**0.2**	-	4
4-chloro-3-methylphenol	**0.1**	**0.1**	-	2
2-chlorophenol	**0.1**	**0.1**	-	2
4,6-dinitro-o-cresol	**0.1**	**0.1**	-	2
2,6-dichlorophenol	**0.1**	**0.1**	-	2
2,3,4-trichlorophenol	**0.1**	**0.1**	-	2
2,3,5-trichlorophenol	**0.1**	**0.1**	-	2
2,4,5-trichlorophenol	**0.1**	**0.1**	-	2
2,3,4,5-tetrachlorophenol	**0.1**	**0.1**	-	2
2,3,4,6-tetrachlorophenol	**0.1**	**0.1**	-	2
2,3,5,6-tetrachlorophenol	**0.1**	**0.1**	-	2
Pesticides				
Aldrin	**0.05**	**0.05**	-	0.35
Carbaryl	**0.05**	**0.05**	-	1
a-Chlordane	**0.05**	**0.05**	-	1
g-Chlordane	**0.05**	**0.05**	-	1
DDT	0.078	1.4	1.4	4
2,4-D	**0.1**	**0.1**	-	2
Diazinon	**0.05**	**0.05**	-	1
Dieldrin	**0.05**	**0.05**	-	1
Endrin	**0.05**	**0.05**	-	0.06
Heptachlor	**0.05**	**0.05**	-	1
Heptachlor epoxide	**0.05**	**0.05**	-	1
Lindane	**0.05**	**0.05**	-	1
Methoxychlor	**0.05**	**0.05**	-	1
Methyl Parathion	**0.05**	**0.05**	-	1
Parathion	**0.05**	**0.05**	-	1
Silvex	**0.1**	**0.1**	-	2
Toxaphene	**1**	**1**	-	2
Inorganics				
Aluminium	30000	30000	-	600000
Boron	30	30	-	600
Cyanide	0.02	0.05	-	1
Chloride	45	220	-	4400
Iron	35000	35000	-	700000
Fluoride	61	61	-	1200
Magnesium	20000	20000	-	400000
Manganese	2200	2200	-	44000
Nitrate & Nitrite	30	44	-	880
Strontium	78	78	-	1600
Sulphur	790	970	-	19000
Titanium	5200	5200	-	100000
Thallium	0.81	0.81	-	16
Uranium	2.1	2.1	-	42

Numbers in bold indicate values are method detection limits [MDLs (i.e. OTR98 Values were below MDL, hence MDL is used)]. Refer to Section 3.1.

3.2 Detailed guidelines

Four classes of fill material will be established:

a) inert fill - a revised definition based on chemical concentrations of contaminants;
b) urban residential fill - a new class of material;
c) urban industrial fill - a new class of material;
d) controlled fill - a new class of material to be deposited at waste sites approved under Part V of the *EPA*.

The classification system is built on a sequence of chemical concentrations for components, moving from uncontaminated material to increasingly contaminated material (refer to Figure 2). Each class of material is limited by an upper chemical concentration for a number of organic and inorganic chemical parameters (Tables 3-1 and 3-1-1). The rationale for the guideline for each fill type are found in Section 3.2.1 through 3.2.4.

After an excess material has been chemically characterized, its classification will determine where the material can be placed. The disposal options for each class of material are summarized in Table 3-2. The generator will have the option of disposing of the material in a more restrictive manner. For example, material classified as urban residential fill could be placed in an urban residential fill site, an urban industrial fill site, or in a controlled fill site.

Table 3-2
Acceptable Destination Land Uses
for Disposal of Fill Materials

Quality of fill	Acceptable land uses at destination sites[a]		
	RURAL GROUP	URBAN RESIDENTIAL GROUP	URBAN INDUSTRIAL GROUP
	All rural, including rural agriculture and rural industrial, except transportation corridors[b]	All urban land uses except urban industrial and urban transportation corridor[b]	Urban industrial, rural and urban transportation corridors[b]
Inert fill	———	———	———
Urban residential fill		———	———
Urban industrial fill			———

[a] Sensitivity of land use groups decreases from left to right in the table
[b] See Glossary for further description of land use activities included

3.2.1 Inert fill

The soil placement guideline for Inert Fill is based on the Ontario Typical Range for Rural Parkland (OTR_{rural}), which represents the 98th percentile of background concentrations of inorganic and organic contaminants in undisturbed, rural parkland surface soils (Table 3-1). For compounds which were undetectable in the background sampling, the guidelines were determined by the analytical detectability (described in Section 3.1 above). Therefore, inert fill is defined as material whose chemical parameters have concentrations at or below the rural background concentrations. This definition is intended to protect the environment from the buildup of any contamination beyond existing rural background conditions.

3.2.2 Urban residential fill

The SPG for urban residential fill are similar to those for the inert fill category in that they are background-based. They rely primarily on the Ontario Typical Range for Urban Parkland (OTR_{urban}). The OTR number is based on background concentrations of inorganic and organic contaminants in undisturbed, urban parkland surface soils. For compounds which were undetectable in the background sampling, the guidelines were determined by the level of concentration which could be analyzed by most laboratories. In a few cases, when the urban parkland background reading was lower than the corresponding reading for rural parkland, then the rural number was substituted.

Using urban parkland background concentrations to define the quality of urban residential fill should ensure that fill imported to urban residential sites will be of as good or better quality than the current soil quality at these sites.

3.2.3 Urban industrial fill

The SPG for industrial fill either are developed from guidelines based on established effects on human or ecological health, as in Section 3.1, or have values which are twice the values for urban residential fill guidelines. The guideline with the lower value, that is, the more restrictive guideline, would be used. Where no effects-based guidelines were available, the urban industrial fill guidelines have been left blank. A person who has soil to dispose of will be allowed to develop these blank numbers in consultation with MOE. However, if no numbers are developed, the more restrictive guideline for urban residential fill for the specific chemical parameter would be used.

This approach has two advantages. First, it provides an extra margin of safety to ensure that urban industrial fill guidelines are not at or above a value at which the first adverse effects are apparent. At their maximum, the chemical concentrations for urban industrial fill will be twice those for residential fill. Secondly, this approach provides an additional degree of groundwater protection as, in many cases, the present effects-based guidelines do not deal directly with groundwater protection.

3.2.4 Controlled fill

To develop the numbers for the SPG for controlled fill, the number, or value, in the effects-based guidelines was multiplied by 10. When an effects-based guideline was not available, the urban residential fill guideline value (urban parkland background) was multiplied by 20. In this manner, a guideline value was developed for each component. Multiplying the values in effects-based guidelines (bulk concentration) by 10 to arrive at values for controlled fill guidelines mean that, for most contaminated wastes, the leachate quality will not be higher than the MOE level for registerable waste (10 times the Schedule 4 Leachate Quality Criteria). Groundwater protection will be provided in the site specific assessment and controls required to receive a Certificate of Approval under Part V of the *EPA* for each controlled fill site.

3.3 Mandatory chemical test list

Chemical testing of any material to be used as urban residential or urban industrial fill will be required by the regulation. A **minimum** list of chemical parameters has been developed for which excess materials destined for urban residential or urban industrial fill sites must be tested. This list is called the Mandatory Chemical Parameter List (Table 3-3).

A site history or review of origins of the material to identify any other suspected contaminants is also required. The site history should consider past land uses and activities at the site, such as: any commercial or industrial activity; chemical storage or accidental spills; underground storage of fuels or chemicals and any remaining tanks; agricultural chemical use or mixing; coal liquidification or gasification; waste disposal or scrap metal or car storage; location of demolished structures such as garages, storage sheds or residences. During excavation, visual inspections should be done to identify any buried debris, unusual discolouration of the soil or presence of odours. If any of these conditions are found, additions to the list to confirm the presence or absence of other chemical parameters is necessary. These suspected contaminants would then be added to the mandatory list of chemical parameters for which the material is tested. Table 3-1-1 lists the guideline values for these additional parameters.

The list of chemical parameters for which the material must be tested is based on the origin of the material. Materials of residential and rural (non-industrial) origin have a shorter mandatory list, which is composed primarily of inorganic parameters, the most likely contaminants of these soils, according to results of extensive sampling by MOE. Soils from agricultural land which has been used for crop or fruit production may need to be tested for certain pesticide or other agricultural chemical residue. Soils from commercial or industrial origins must be analyzed for both inorganic and organic parameters. The organic list includes many of the common industrial solvents, as well as other common industrial contaminants, such as PCBs and certain PAHs and phenolics.

Table 3-3 lists the chemical parameters which must be tested for in materials originating in residential and industrial sites. The Mandatory Chemical Parameter List for soil-like and rock-like materials resulting from industrial waste streams is the same as for soils of industrial origins. However, if the generator can demonstrate conclusively that a particular parameter on the mandatory list cannot be present in the waste, then there is no need to test for it.

Table 3-3: Mandatory chemical parameter list

(i) Material of residential and rural (non-industrial/commercial) origin

Inorganics

Antimony	Mercury
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium VI	Vanadium
Chromium (total)	Zinc
Cobalt	Electrical Conductivity
Copper	Sodium Absorption Ratio
Lead	pH

Plus

Any elements or compounds which an examination of the history of origins of the material indicate are likely to be of concern.

(ii) Material of industrial/commercial origin

Inorganics

Antimony	Mercury
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium VI	Vanadium
Chromium (total)	Zinc
Cobalt	Electrical Conductivity
Copper	Sodium Absorption Ratio
Lead	pH

VOCs

Benzene	Trichlorofluoromethane
Toluene	Ethylene dichloride
Xylene (total)	1,1,1-trichloroethane
Methylene chloride	Trichloroethylene
Carbon tetrachloride	Tetrachloroethylene

PAHs

Benzo(a)pyrene	fluoranthene
dibenz(a,h)anthracene	phenanthrene
benzo(a)anthracene	napthalene
benzo(g,h,i)perylene	pyrene

PCBs

Total PCBs

Phenols

2,4,6-trichlorophenol	p-cresol
2,4-dichlorophenol	pentachlorophenol

Plus

Any elements or compounds, which an examination of the history of origins of the material indicate, are likely to be of concern

3.4 Procedures for Sampling and Analysis

Sampling procedures or protocols have been developed which specify the minimum sampling required to adequately characterize the chemical properties of excess material so that they can be classified into the soil placement categories. The appropriate suite of mandatory chemical analyses must be conducted on the minimum number of samples as described in Table 3-4. Sampling can be carried out in one or two stages, i.e., all samples taken at one time or an initial sampling followed by a second sampling. The detailed protocol is found in the document entitled "Sampling, Processing and Analytical Protocols for Bulk Chemical Characterization of Soils, Rocks and Like Materials", which is available upon request.

Within any soil or soil-like material that requires characterization there is an inherent variability of chemical properties. The degree of variability differs according to numerous factors, including area of sampling, mode of contamination, the chemical compound itself and soil type. All sampling plans must account for this variability. Site history and history of origin of the material must be accounted for in choosing sampling locations.

Sampling protocols have been developed for different sampling scenarios: in-situ sampling; and, sampling from material piles. In-situ sampling is preferable to the sampling of piled materials since "hot spots" and specific contaminants of concern can be more easily identified and volumes of contaminated materials potentially reduced.

TABLE 3-4: SUMMARY OF SAMPLING PROCEDURES

1) Principles
- must perform full set of mandatory chemical compound tests on minimum number of samples outlined.
- can choose either one or two stage sampling.

2) In-situ sampling

A) Surface
- sample at 0 - 25 cm
- composite samples of at least 10 cores/sample
- sampling frequency as specified
- hot spots receive greater frequency

B) Depth sampling
- sampling depths at 25cm -1 m, 1 - 2 m, 2 m - 6 m, 6 m - 10 m ,then one sample for every 5 metres depth of excavation.
- sampling frequency as specified
- hot spots must be sampled at greater frequency

3) Sampling from material piles
- composite samples from throughout pile
- number of samples as specified

4) Sampling from waste streams
- sample composed of composites over time.
- sampling frequency as follows
  - 1 / $10m^3$ for first $100m^3$
  - 1 / $100m^3$ for next $900m^3$
  - 1 / $500m^3$ from then on.
- must also follow guidelines for specific waste type if they exist.
- includes description of interpretation of results.

Guidance to ensure the high quality of the analytical data is provided in " Sampling, Processing and Analytical Protocols for Bulk Chemical Characterization of Soils, Rocks and Like Materials" document which is available upon request. It provides detailed information on analytical method guidelines and method detection limits for each chemical parameter. Specific advice is provided on necessary laboratory quality control steps, such as the addition of surrogates or substitute chemicals and the review of surrogate recovery rates. This information will provide the generator of the excess material with useful information to direct the laboratory he has chosen, to conduct the required analysis.

3.4.1 Exceeding guideline values

Under the proposed policy, if any SPG in one category is exceeded, then the material being tested would not be classified in that category. In the case of soil sampled *in situ*, then all material would be considered contaminated which fell between a sampling site which exceeds a guideline value up to the next closest uncontaminated sampling site. For industrial waste streams, classification of the material is based on the highest result of any sample analysis. If any one sample exceeds a guideline for any chemical parameter, then any material produced subsequent to that analysis is deemed to be classified in the more contaminated category, unless the specific load is tested and found to be less contaminated. After three sets of analysis representing the full variability of the process, parameters for which all results were non-detectable can be dropped from the slate of chemicals required for analysis. Any change in the process which may affect the waste quality requires immediate sampling at the most frequent rate shown in Table 3-4.

For each sample required in the sampling protocol, single analytical results will be required. Duplicate sampling is an option for the generator if additional confidence is required. In these cases, the mean value of the results would apply.

3.5 Issues and options

The main issues which emerged during the development of the SPG are summarized below.

1) **Groundwater protection issues and leachate testing** - This policy must ensure that the disposal of contaminated soils does not in any way degrade or impair the quality of sensitive groundwater aquifers in the province. The MPC has approached this issue from a number of perspectives. It studied the relationship in soil between bulk chemical concentrations and leachate concentrations at representative rural and urban sites during the OTR background sampling program. The committee also examined historical data from Laboratory Services Branch (Regulation 309) and Metropolitan Toronto Regional Conservation Authority (Lakefilling) for information. In addition, MPC met with staff in WMB/Regional Operations (groundwater/ hydrogeological specialists) and WRB to assess groundwater impacts and explore protective options.

These studies indicated that even uncontaminated material such as inert fill can, for a few chemicals, produce leachate test results greater than the Ontario Drinking Water Objectives (ODWO) and therefore, has the potential to contaminate groundwater. On the basis of these findings, the ability of the current leachate test to accurately model the leaching of contaminants from soil to groundwater must be questioned, as there is no evidence that background concentrations, as found in the OTRs, result in contaminated groundwater. On the basis of this assessment for soil materials, and the fact that there were only a limited number of ODWOs to use for comparative purposes, the MPC decided not to use leachate testing for soil, rock or similar materials covered in the policy.

After careful consideration, the MPC recommended that groundwater protection be addressed via modifications to the policy in the following manner:

a) alteration in the disposal/land use categories by including commercial land use with residential land use, and by limiting placement of industrial fill to fully serviced (water and sewers) urban areas only;

b) incorporation of more stringent SPG so that no numbers in the urban industrial fill guidelines (effects-based) are more than twice as high as the numbers in the background-based, urban residential fill guidelines;

c) limiting soil placement by referencing in the policy existing MOE/provincial/municipal policies/agreements (e.g., MNR Wetlands Policy, MOE Reasonable Use Policy).

This approach provides extra groundwater protection by imposing stricter guidelines for the placement of fill. It provides groundwater protection for sensitive areas where there is dependence on groundwater resources by banning placement of urban residential or urban industrial fill from rural land use sites. Costs are lower because no leachate analysis is required. However, the restriction on the placement of urban residential and industrial fill limits the number of possible fill sites.

2) **Degree of environmental protection versus disposal possibilities** - In developing the four sets of SPG, the committee has used a combination of background-based and effects-based values. These approaches have been used primarily to protect the receiving site (potential for exposure to contaminants) and to provide groundwater protection. The overriding principle has been to ensure sufficient strictness in the guidelines to minimize contamination of the environment above existing levels. The committee also tried to ensure some degree of continuity with existing soil cleanup and decommissioning activities, as well as the classification of hazardous wastes via Regulation 309.

The SPG for urban residential fill and urban industrial fill have been developed in a conservative manner to protect against degradation of the environment by the deposit of imported fill. The guideline values are, in general, many times lower than the Decommissioning Guidelines for the same chemical parameters, which are effects-based levels to clean soil at a contaminated site.

3) **Limitations in effects-based guidelines** - It would be time- and resource-intensive to establish comprehensive guidelines based on risk assessment for the protection of human and environmental health. Because of the immediate need for the SPG, the MPC has combined a background approach with best available effects-based information. Overall, there is a serious lack of scientifically-derived soil guidelines in the scientific literature. The MPC has reviewed soil guidelines from other jurisdictions to determine their suitability for use in the Materials Management Policy. This information was used to check that the urban industrial fill guideline for a contaminant was below any concentration for that chemical which was known to have a detrimental effect on human health or the environment.

The basis for the guidelines developed in other jurisdictions varies. Some guidelines are based on site-specific conditions and may have limited generic application. Other effects-based guidelines may not use a full multi-media approach. The rationale for the SPG is described in more detail in the document "Rationale for the Development and Application of Bulk Chemical Soil Placement Guidelines for Management of Excess Soils, Rocks and Like Materials".

4) **Policy options for exceeding guidelines** - The MPC has recommended that no instances of exceeding the SPG be allowed. In other words, material must meet the SPG for all chemical parameters in a particular classification to use the disposal options associated with that classification. If material fails even one guideline, it must be classified in the next highest category. This rigid approach to exceeding guidelines provides the maximum environmental protection with the minimum of ministry management. It does limit disposal options. Also, some other jurisdictions, such as New Jersey (proposed), do allow some instances of exceeding guidelines.

A more lenient policy could allow one limit (or more) to be exceeded by a certain percentage (e.g., 10%). This approach would increase the flexibility of the policy and the disposal options. However, it would reduce the degree of environmental protection and could be viewed by the public as a lack of protection. It also would require more decision-making on the part of the generator and the receiver of the material.

4 APPROVALS PROCESSES

The approvals processes in combination with the chemical classification guidelines are intended to provide a clear set of rules to determine what are the possible disposal options for excess soil, rock and similar materials. The detailed description of the proposed approval process is found in Appendix I.

4.1 Principles

The following principles have been used in the development of the revised approvals process for soil, rock and similar material:

a. maintain environmental integrity (short and long term) of site receiving excess material;

b. develop an order of approval requirements which reflect different levels of potential environmental concern;

c. develop a simple process;

d. ensure timely processing of applications;

e. place responsibility on both generators and receivers of excess material for proper management in accordance with legislative requirements;

f. provide for public involvement where potential for environmental effects may be significant;

g. limit legal amendments to those requiring administrative or Regulation change as basic requirements of *EPA* and *EAA* are fundamentally sound.

4.2 Inert fill

Inert fill currently is an exempted waste under Regulation 309 of the *EPA*, and, as such, is not required to meet any MOE requirements for disposal as a waste. This exemption does not apply to other limitations on the placement of fill such as the Lakefill Quality Guidelines, or restrictions or approvals that may be required by a conservation authority or a municipality.

A revised definition of inert fill has been proposed which includes soil, rock or similar materials of the same or better quality than background soil in rural parkland. Mandatory chemical analysis is proposed for soil-like or rock-like materials which may be classified as inert fill. However the generator, who is legally liable (responsible) for classifying the material accurately, will determine if analysis is necessary when the fill originates from excess native soil or rock. Some things the generator should consider are: the history of land

use at the site, visible staining of the soil, odour, the presence of existing fill material. The receiver of the material becomes responsible for the proper classification when fill is placed on their property under both current and proposed regulation.

4.3 Permit by rule for urban residential fill sites and urban industrial fill sites

Permit-by-rule approvals processes are designed to place explicit responsibilities on the generator and receiver to appropriately manage fill including selection of the disposal site for certain soils, rock and similar material, without the need for site-specific approvals from MOE. Specific rules have been developed which set out:

1. the quality of fill which is suitable for use as either urban residential fill or urban industrial fill;

2. the chemical analysis which is required;

3. the records which must be kept by either or both, the generator and receiver.

Any generator of soil-like or rock-like solid waste, e.g. foundry sands or ash, must test and keep records for all materials which they dispose of including inert or permit-by-rule fill.

By following the rules set out by the ministry, the generator and receiver of permit-by-rule fills benefit from the new process since there is no requirement to receive site specific approvals, which should result in timely disposal and perhaps in reduced costs as well.

In establishing stringent SPG, the potential environmental risks from **permit-by-rule** fill are minimized.

4.4 Approvals for Controlled Fill Sites

Controlled fill sites are to be used for soils, rock and similar materials which meet the SPG for controlled fill. These sites require a site specific Certificate of Approval issued under Part V of the *EPA*. The certificate will require the same information required on all Part V applications such as site characteristics, evaluation of the potential for groundwater to be affected by the fill, the quantities and sources of the fill. It is recommended that these sites not be subject to the *EAA*.

4.5 Exemptions

To reduce the costs and requirements for small operations, some exemptions from testing requirements and record keeping are recommended for small quantity generators and for on-site movement of excavated native soils and rocks. Haulers of permit-by-rule fill will also be exempt from requiring a Certificate of Approval under the *EPA* for hauling waste.

No exemptions from testing or approvals are proposed for soil-like or rock-like materials because of the greater potential for chemical contamination.

5 GENERIC CLASSIFICATION PROCEDURES

To reduce the costs of unnecessary analytical testing by generators of excess materials and to streamline the administration of the policy, it is recommended that **the opportunity for generic classification** of materials be provided. The generic classification approach would apply to two distinctly different types of excess soil, rock and similar materials:

i) materials which are generated by an activity such as road construction and maintenance;
ii) homogeneous industrial solid waste streams.

The basic framework for the generic listing of industrial waste has been prepared, as have proposals for the management of surplus road construction material. The description is found in Appendix II.

After public consultation, detailed procedures will be developed.

5.1 Generic classification of excess road construction and maintenance materials

Most material which is generated and managed within the highway right-of way (but not including the adjacent properties) during construction and maintenance will not require chemical analysis and classification. Exceptions are materials which are known potentially to contain high concentrations of various chemical contaminants which have been deposited on the road surface, shoulders and in road sweepings and catch basin cleanouts or materials which are managed out of the right-of-way.

5.2 Generic wastes listing process

It would be onerous and unnecessary to test every load of a material which can be demonstrated to be homogeneous in composition, to have consistent characteristics and which is produced regularly in large quantities. A set of guidelines describing how to have these types of materials generically classified has been developed. By following the generic classification guidelines, the class into which a specific material falls can be determined. In this way, individual chemical analysis of each load of material would not be necessary for disposal purposes.

A generator, either representing a single site/source or in concert with other similar sources of excess materials, may approach the MOE to request a generic listing of a specific excess material. Figure 4 outlines the path which the generator must follow to have a material generically classified.

The generator should consult with the Ministry to get guidance on the preparation of a submission. The chemical parameters on the mandatory test list will be the same as if the material were unlisted. However the number of samples requiring analytical testing will be approximately twice as many. The generator will need to submit a proposal document to the MOE, which must include the following information (see Appendix II for detailed information):

i) General industrial process
ii) Waste generation process
iii) Waste composition
    a) sampling program and methods
    b) analytical methods
    c) physical characteristics
    d) chemical characteristics
iv) Interpretation and recommendation

The proposal document will be reviewed by an internal MOE staff committee to be established for this purpose. During the review process, the committee may require clarification or additional information from the generator before recommending acceptance or denial of the request to the Minister for inclusion in schedules under Regulation 309.

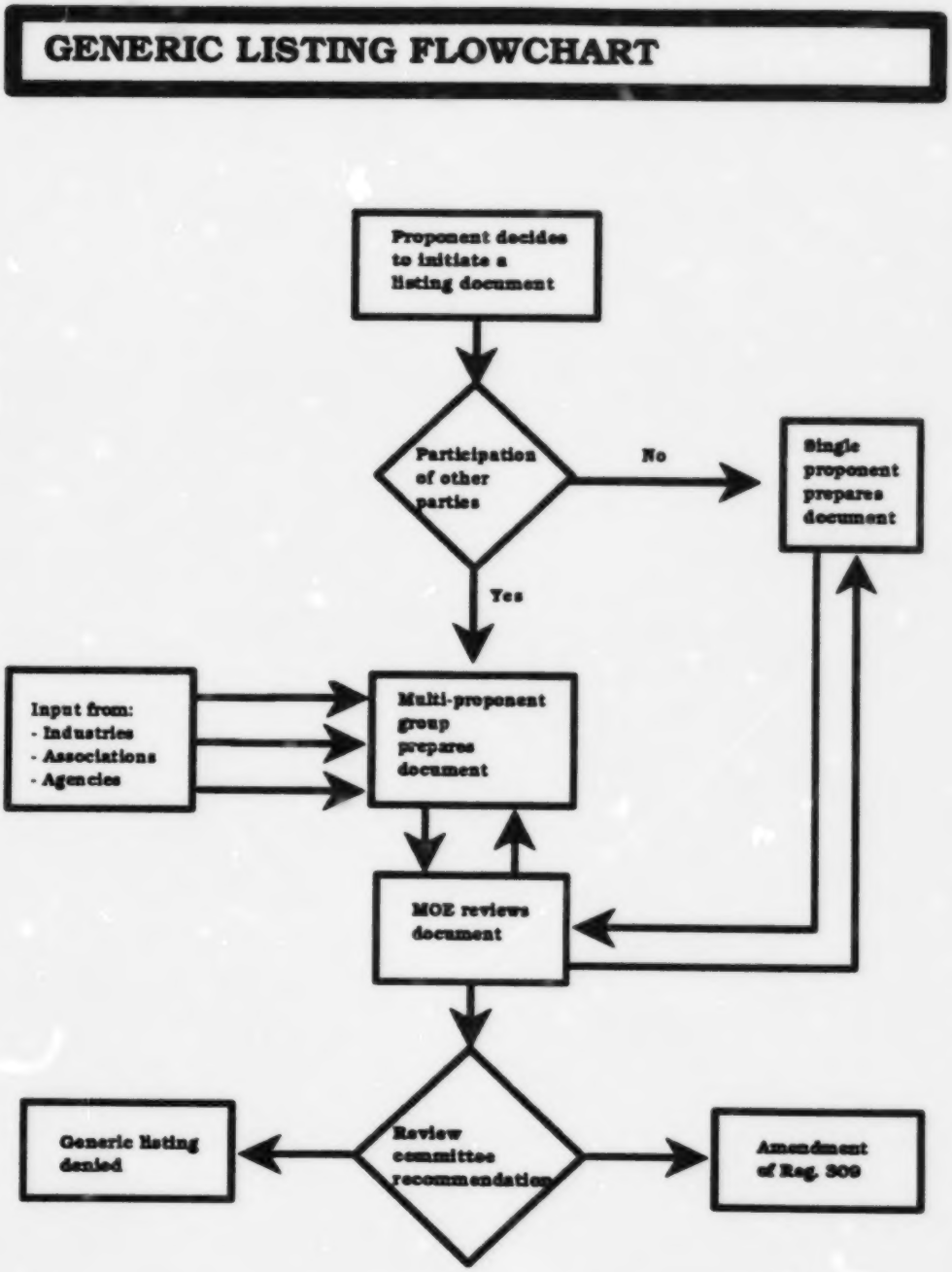
5.2.1 Schedules of classified materials

These schedules will be part of the revised Regulation 309. When the policy is initially implemented there may be only a few such schedules. The proposed policy includes a process for development of additional schedules.

5.2.2 Policy on exceeding guidelines

The same rules apply to both generically classified and non-generically classified materials. Samples which exceed any one of the guideline numbers for a specific classification are judged to have failed to meet the requirements for that classification of material and must be judged against the classification guidelines for more restrictive classifications. This process is shown in Figure 4.

FIGURE 4


GENERIC LISTING FLOWCHART
Proponent decides to initiate a listing document
Participation of other parties
No
Single proponent prepares document
Yes
Input from:
- Industries
- Associations
- Agencies
Multi-proponent group prepares document
MOE reviews document
Review committee recommendation
Generic listing denied
Amendment of Reg. 309

5.2.3 Sampling protocols for industrial process wastes

Sampling and testing of a material which may be listed generically in the regulation will be more rigorous than for unlisted materials, since subsequent sampling generally will be less frequent after the material is listed. The sampling considerations for generic materials will be an extension of the non-generic sampling protocol which includes the following items:

i) Number of samples
ii) Frequency of sampling
iii) Sampling method/location of sample sites
iv) Number of sites with similar operations

5.2.4 Administrative Structure

To administer the Generic Classification process, it is proposed that a standing committee, the Excess Materials Generic Listing Review Committee be formed. Membership on EMGLRC will be made up of staff from:

i) Waste Management Branch
ii) Hazardous Contaminants Branch
iii) Regional Operations Division
iv) other branches, as required.

Waste Management Branch would chair EMGLRC and co-ordinate regulatory amendments. This committee will meet on an as-needed basis to review proposals for generic listings and to make recommendations for changes to the schedules in the revised Regulation 309.

6 ECONOMIC IMPLICATIONS

An initial assessment of the potential economic implications on the regulated sector has been prepared by Fiscal Planning and Economic Analysis Branch using information from MOE staff and confidential information collected from potentially affected industrial sectors by a contracted consultant. The detailed report is available upon request, entitled "Policy for Management of Excess Soil, Rock and Like Materials - Initial Economic Assessment". The following is a summary of the main points from this report.

6.1 Background and Purpose

The economic impact of proposed policies is an important consideration in their evaluation. The initial economic assessment will be revised following the consultation process based on new information and response to the assumptions. The revised economic assessment will be used in evaluating the necessary revisions or changes to the policy as it is finalized.

In evaluating the potential economic implications of the policy, the key component of the proposed policy is a classification scheme which allows for a range of disposal options for excess materials based on their chemical composition. The classification process requires chemical testing in some cases, which may be a new or increased cost, that may be offset if less costly disposal options become available for less contaminated material.

6.2 Estimates of Quantities of Material

For the assessment, four quantity scenarios were developed:

- a "**current situation**" or base-case scenario of existing disposal costs faced by generators of excess material,
- three scenarios utilizing the **low quantity**, **mid-point quantity**, and the **high quantity** estimates.

The difference between the current situation scenario and the other three scenarios is used to estimate the potential economic impacts of the proposed policy.

To estimate the amount of material affected by the proposed policy the following assumptions were made:

- materials currently stockpiled will not be affected by the policy and current stockpiling volumes are assumed to remain unchanged,
- illegal dumping will neither increase nor decrease,
- current levels of 3Rs activities will continue for the identified materials.

Based on information currently available, a single scenario of how each material would be classified and disposed has been utilized. This disposal scenario is based, to the extent possible, on our limited knowledge of the chemical characteristics of materials for which soil placement guidelines (SPG) have been developed. This information is not complete for all material types, since the ministry has not required analysis for the suite of SPG parameters in the past.

Table 6-1 provides a summary of the estimated annual quantities of material affected by the policy. Ranges of possible quantities have been generated.

Table 6-1: Summary of Estimated Quantity of Material Requiring Disposal (Tonnes)

Excess material	Annual quantity requiring disposal (Tonnes)
Dredged materials	340,000 to 460,000
Excavated soil and rock	1.5 to 4 million
Old concrete, bricks and masonry	800,000 to 1,500,000
Foundry sand	105,000 to 195,000
Old Asphalt	280,000 to 460,000
TOTAL	**3,025,000 to 6,675,000**

6.3 Economic Implications of the Proposed Policy

Transportation costs for some materials are likely to be lower under the new policy, assuming that more disposal sites will be available to the generator and, therefore, potentially less distance will have to be travelled.

Sampling and chemical analysis costs are likely to increase as more contaminants will have to be tested to determine the classification of the material.

Tipping fees for the new disposal site options are likely to be lower than prevailing rates in Southern Ontario municipalities because site development costs are expected to be lower for these less engineered sites. Furthermore, the increased number of sites may bid down tipping fees.

For the materials examined, between $14.8 million and $51.4 million in savings or avoided costs could be realized. Table 6-2 summarizes the potential savings for disposal for the identified materials. The range of estimated savings is based on the range of quantities of excess material requiring disposal (from Table 6-1) and estimated disposal costs for each group of material at each disposal option.

Table 6-2: Summary of Estimated Disposal Costs by Material

Excess material	Estimated cost under current situation ($million)	Estimated cost under proposed policy ($million)	Potential net annual savings ($ Millions)
Old concrete, masonry and brick	$24.2 to $67.0	$16.9 to $45.1	$7.4 to $22.0
Waste foundry sand	$5.7 to $14.8	$3.2 to $8.4	$2.5 to $6.4
Old asphalt	$4.7 to $13.1	$11.0 to $29.8	($6.2 to $16.6)
Dredged materials	$2.7 to $5.4	$2.2 to $4.4	$0.5 to $1.0
Excavated soil and rock	$36.4 to $138.0	$25.8 to $99.4	$10.6 to $38.6
TOTAL	**$73.7 to $238.3**	**$59.1 to $187.1**	**$14.8 to $51.4**

Additional benefits are expected from the proposed policy:

- Illegal dumping should decrease as cheaper disposal options become available,
- Capacity depletion at municipal sanitary landfill sites should decline if excess materials are directed to inert fill, urban residential fill, urban industrial fill, and controlled fill sites, and,
- Additional savings will accrue if stockpiled materials eventually require disposal off-site, as less expensive disposal options, such as urban residential fill, urban industrial fill, and controlled fill sites, will be available.

6.4 Sector-specific analysis

It is estimated that net cost savings will be distributed primarily across the following sectors: foundries; residential and commercial construction; demolition; and, road construction and maintenance. The residential and commercial construction, demolition, and, road construction and maintenance sectors generate excess soil and rock; old concrete, masonry and brick; and old asphalt.

Analyses indicate the proposed policy will result in savings for the disposal of two of these groups of material: excavated soil and rock; and, old concrete, masonry and brick. As shown in Table 6-2, savings for these two groups of materials range from a low of $18 million ($7.4M + $10.6M) to a high of $60.6 million ($22M + $38.6M) in avoided annual disposal costs. Since the residential and commercial construction, demolition, and road construction and maintenance sectors generate the majority of these groups of material, a large part of these savings will be distributed among these three sectors.

However, the cost to dispose of old asphalt is expected to increase between $6.2 million and $16.6 million. This is based on the proposal in the policy to restrict asphalt, which is not reused or recycled, to controlled fill and municipal fill disposal options. These costs are also likely to be shared by the three sectors which generate this excess material (residential and commercial construction, demolition, and road construction and maintenance). This increase in costs will, however, hopefully cause increased 3Rs activities for these material -- which will dampen the cost increases.

Foundries in Ontario could save between $2.5 million and $6.4 million annually in residual foundry sand disposal costs as a result of the policy.

Dredging activities disposal costs are expected to decrease between $0.5 million and $1.0 million annually.

It is estimated that revenues to landfill site owners, both private individuals and municipalities, could decline $30 million to $87 million annually. This is a savings to waste generators who will be using less expensive disposal options. However, tipping fee revenues at controlled fill sites could be between $14 million and $46 million per year. Both private owners and municipal governments will be able to establish controlled fill sites.

6.5 Regional Impact Assessment

In general, the more waste that can be diverted from municipal landfill sites, the larger will be the impact on communities.

The Greater Toronto Area (GTA) will experience the greatest potential savings as a result of the policy because large quantities of soil and soil-like materials are generated within GTA boundaries from construction and demolition activities. Tipping fees at municipal landfills in the GTA are also notably higher than in the rest of the Province.

The implications for Southern Ontario will not be as dramatic as in the GTA. The cost savings associated with a greater number of less expensive disposal sites will be less, given lower tipping fees than in the GTA. However, many municipalities are increasingly suffering from disposal capacity constraints and raising tipping fees.

In areas of Northern Ontario, where tipping fees are currently low or absent, there will be little incentive to test material for classification as urban-residential, urban-industrial fill or controlled fill. Unless municipal tipping fees increase drastically, or transportation costs are high, stakeholders will recognize limited saving in redirecting their residual materials to newly formed sites. Municipalities may be interested in establishing controlled fill sites if they face capacity depletion at municipal landfill sites and new municipal landfill sites are more difficult to create.

7 NEXT STEPS

After the consultation period, the Minister of the Environment will receive a report and recommendations from the Advisory Committee on Environmental Standards. In addition, to public consultation by ACES, consultation within the Ontario government will be conducted in parallel by the Ministry of the Environment. The comments received during interministerial consultation will be provided to ACES. The policy will be revised taking into account all the comments received.

Following this, the amendments required to Regulation 309 will be prepared so that the policy can be implemented. These amendments will be published in the Ontario Gazette.

Following completion of the policy and regulation amendments, the ministry intends to publish a Guidance Manual for use by MOE staff and interested persons describing in detail the procedures to be followed in managing excess soil, rock and similar materials. This document will be the technical guide to the policy and regulation.

EXAMPLE SCENARIOS

The following scenarios have been provided to illustrate how the proposed policy on excess materials might work. The scenarios are intended to help the reader determine the possible implications of the proposed policy. The Ministry encourages comment on any aspects of the policy.

These scenarios are for illustrative purposes only during consultation -- they are not a formal guide to compliance with the policy when it is completed.

Scenario 1

A homeowner in an urban area plans to excavate part of his garden to install a backyard swimming pool and wants to know the options for disposing of the soil.

HOMEOWNER CONSTRUCTS SWIMMING POOL
Summary of key points

- History of potential contamination
  - in situ sampling
  - test against mandatory list of chemicals
  - owner responsible for sampling and analytical costs
  - test for specific contaminants, based on site history
  - determine potential destination based on testing analysis and soil placement guidelines (SPG)

- No history of potential contamination
  - May qualify for SQE
    - no testing
    - no record keeping
    - may deposit in urban residential fill site

If there were a history of possible site contamination, the homeowner would be required to do a quality analysis of the soil. Thus the soil would be tested, preferably at the site before excavation begins, for the mandatory minimum list of chemicals, plus any other chemicals suggested by the site history. In an undisturbed residential location, the top 15 cm of garden

soil might show traces of contamination, such as would come from particles in a car exhaust or from paint chips.

If, as a result of testing, the top soil were classified as urban residential fill, it could be deposited at any fully serviced urban site - that is, a site which is serviced by sewers and water mains.

Under permit by rule, no certificate of approval would be required for the site receiving the urban residential fill. The owner of the receiving site would be responsible for record keeping. Any permit-by-rule site also is governed by local regulations, that is, municipal bylaws or regulations imposed by a conservation authority or commission, such as the Niagara Escarpment Commission.

Alternatively, if the garden top soil was classified as urban industrial fill, it could be used at any fully serviced urban industrial site or as fill in any transportation corridor.

The soil deeper than, say 15 cm, might be inert fill if the contamination was only on the surface. This inert fill material could be placed virtually anywhere that soil deposit is permitted, from a park where a ski hill is being built to a property which is being contoured, providing local regulations were observed. Even for inert fill, the resident would have to consider the history of the use of the land, visible staining and odour, and the presence of existing fill material to determine if it is necessary to do a chemical analysis of the soil.

If it were known that the soil had not been contaminated in the past, and since the amount of excess soil would be less than 150 cubic metres -- about 15 dump truck loads -- the homeowner could qualify for the Small Quantity Exemption (SQE) and would not have to conduct tests or keep records.

The SQE is designed to permit small amounts of soil generated in a residential setting or a rural (but not rural industrial) setting to be deposited in an urban residential fill site such as an urban parkland without quality analysis or record keeping.

Scenario 2

The homeowner demolishes an extra garage with an earthen floor to make room for the swimming pool.

GARAGE DEMOLITION
Summary of key points

- Demolition debris - 3Rs approach
- Sample soil in situ
- Do mandatory chemical testing for specified constituents at owner's expense
- Test for any other chemical suggested by site history
- Classify soil according to chemical concentrations and SPG
- Deposit in site determined by SPG

In such a case, the homeowner would have to consider disposal both of the debris from the demolished garage and of the soil excavated from under it. Demolition debris, which is not soil, rock or similar material such as brick or concrete rubble, would not come under the new policy. Options to deal with the demolition material under the 3Rs approaches should be considered first. As a final resort, the material would have to go to a municipal waste disposal site.

As the garage has an earthen floor, soil excavated from under the garage likely would be more contaminated than ordinary garden soil. Oil or gasoline could have leaked from cars. Again, soil should be tested in place and, after analysis, classified according to the soil placement guidelines (SPG) to determine if it should go to an urban residential fill site, an urban industrial fill site or a controlled fill site.

Scenario 3

A contractor is building a new road through a previously undisturbed area.

BUILDING NEW ROAD
Summary of key points

- Right-of-way exemption
  - classified generically as inert fill within right-of-way
  - no testing or record keeping
- Excess soil assessed and classified
- Determine destination through SPG
- Clearing and grubbing material
  - Compost or recycle
  - Generically exempted waste if placed in limited quantities on adjacent property owner's land
  - excess material in certified landfill site

Mineral and organic soils excavated at the site which are then used or deposited within the construction area of the road will be designated as inert fill without requiring chemical analysis. The construction area is the road right-of-way and a specified part of the property which has a common boundary with that of the road right-of way.

If excess soil is used or deposited outside the construction area, the contractor must properly classify the soil and manage the soil, similarly to the homeowner above, whether it be inert fill, urban residential or urban industrial.

Clearing and grubbing materials, the vegetation and natural wood materials on the right-of-way which have to be removed to construct the road, are generally suitable for composting or recycling (especially wood).

However, clearing and grubbing materials would be in a generically exempted category if they were placed on adjacent property in limited amounts, with the property owner's approval. If there are excess clearing and grubbing wastes, they must be taken to an approved landfill site which has a Certificate of Approval from the ministry to accept these types of waste, e.g. a municipal landfill site.

Scenario 4

The same contractor widens a busy highway.

WIDENING HIGHWAY
Summary of key points

- Right-of-way exemption
  - manage material within right-of-way
  - no testing or record keeping
- Assess and classify extra material
- Determine destination through SPG

In this case some of the options could be different.

Roads and right-of-ways become contaminated with a variety of chemicals from vehicles, road maintenance and from road construction materials. Oil, grease, lead, PAH (chemicals from the exhaust from gas and diesel fuels), and road salts occur most commonly.

The contractor can take advantage of the right-of-way exemption, to use the excess material for on-site construction, without chemical testing and classification.

But any material subject to the classification under Materials Management Policy and, not used on site, would require chemical quality analysis. If the soil, contaminated from road salting and runoff, were classified as controlled fill, it could be deposited at a controlled fill site. Such a site would require a Certificate of Approval issued by the ministry. However, materials not subject to chemical classification, such as clearing and grubbing material, must be disposed of at approved sites accepting these wastes, such as a municipal landfill.

Scenario 5

The developer of a condominium complex on a former industrial site expects to have a large quantity of excess soil to dispose of.

DEVELOPING RESIDENTIAL (CONDO) SITE
Summary of key points

- On-site exemption for soil meeting decommissioning guidelines
- Contact district office of the Ministry - discuss with district officer
- Test soil - compare with decommissioning guidelines

- Soil contaminated above decommissioning guidelines
  - manage soil as approved by MOE, e.g. treat soil to comply with decommissioning guidelines or remove to appropriate landfill sites

- Soil within decommissioning guidelines
  - if not used on-site, excess soil destination according to SPG

If the soil quality meets MOE decommissioning guidelines for the proposed land use, then the developer may use the soil for on-site construction, such as contouring or building noise berms. In such a case, the on-site exemption would apply - that is, the soil excavated and used in the same site would not have to meet the more restrictive quality limits of the SPG for materials imported to that site. Quality testing based on the mandatory list of chemical compounds in the decommissioning guidelines would be required, plus testing for additional compounds based on site history, any past spills, and visual inspections.

In such a scenario, the developer is urged to contact MOE's district office and consult with the district officer.

If some of the soil is contaminated above the decommissioning guidelines, the developer is encouraged to treat the soil rather than remove it. The developer who removed soil from a site which was still above the decommissioning guidelines would have to manage that soil as a waste. Remediated soil used on site would need to comply with the decommissioning guidelines, not the more stringent SPG.

If soil within the guidelines had to be removed from the site, it would be deposited according to the SPG.

Scenario 6

A foundry owner needs to dispose of the foundry sand regularly produced as a waste at the operation.

DISPOSING OF FOUNDRY SAND
Summary of key points

- First consider 3Rs alternatives
- Test waste stream for chemical characteristics based on mandatory list
- Dispose in appropriate site based on classification
- May submit documentation requesting generic listing if material has consistent chemical characteristics and is in regular production

Before considering disposal, the owner should try to reuse the foundry sand by treating it to remove chemicals used as binders. If the foundry sand must be disposed, then testing would be done on an ongoing basis from the waste stream. The ministry sampling protocols indicates the minimum frequency and number of samples required. The mandatory testing list indicates which chemicals must be tested for; any additions to the list would be based on possible contaminants associated with specific process chemicals and process characteristics. If the foundry sand tests as urban residential or urban industrial fill, it may go to an urban residential fill site or an urban industrial fill site.

Since the material is an industrial by-product and not native soil or rock, records must be kept by the foundry owner of the analysis results and the locations where the material is placed, even if it is classified as inert fill. The owner of the fill site will be required to keep records if the material is urban residential or industrial fill quality.

If the foundry sand is consistent in its chemical makeup, it could be a candidate for generic listing. Generic classification may be worthwhile where the material is of uniform composition, has consistent characteristics and is produced regularly in large quantities. If a material is generically classified, there may be a considerable reduction in the frequency and types of chemical tests required for each new batch of waste material.

Scenario 7

The owner of a quarry wants to use "clean fill" to rehabilitate the quarry workings .

FILLING QUARRY
Summary of key points

- Check local regulations governing fill
- Subject to local rules, inert fill acceptable
  - soil or rock, no record keeping
  - soil-like or rock-like material such as ash or slag which meets inert fill criteria (necessary for generator to do quality analysis & keep records for two years)
- Urban residential or industrial fill not acceptable unless full water and sewer servicing at the site
- Certificate of Approval required to accept controlled fill material

Subject to approval of the Ministry of Natural Resources and provided local regulations (such as municipal or conservation authority rules) are met, the owner could accept inert fill. Once he accepts the material, the owner is responsible for the material being correctly classified. He may request the generator for information to confirm the classification.

If the inert fill is soil or rock, no record keeping would be required. If the inert fill is similar to soil or rock, such as ash or sand from industrial processes, quality analysis would have to be done and records kept by the producer (generator) for two years.

Scenario 8

A developer needs fill to "improve" an uneven, rocky site for a shopping mall on the outskirts of a town.

CONTOUR SITE
Summary of key points

- Check local regulations governing fill
- Check land use of site
- Subject to local rules, inert fill acceptable
  - soil or rock, no record keeping
  - ash or foundry sand, quality analysis records kept for two years by producer
- Permit-by-rule site possible if full water and sewer servicing
  - could accept urban residential fill material
  - no certificate of approval required for site
  - site owner must keep records for two years of quality analysis, quantity and placement, as does the generator of soil-like or rock-like material

Again, provided local regulations (such as municipal or conservation authority rules) are met, the site owner can accept inert fill and keep no records. If the inert fill is from industrial processes, chemical analysis would have to be done and records kept for two years by the industrial producer.

If the shopping mall site is in a fully serviced location, it could become a permit-by-rule site, accepting urban residential fill. Site designation is based on local zoning and whether or not the site is fully serviced, that is, has both water and sewer mains.

It would be the responsibility of the person wanting to dispose of the fill - the generator - to determine that the quality of the fill was suitable for the land use group (in this case urban residential fill). Furthermore, if the fill is made up of soil-like materials, it would be up to the both the generator of the fill and the receiver to keep quality analysis, quantity and placement records for two years. If the shopping mall area is designated a permit-by-rule site, it would be the responsibility of the site owner to keep records of quality analysis, quantity and placement for two years.

Scenario 9

Is compliance with Materials Management Policy all that is necessary to place fill? No.

WETLAND DEVELOPMENT
Summary of key points

- Check Local regulations
- Check MNR re permit under *Fisheries Act*
- Check local conservation authority (if any) for restrictions
- Check land use designation (zoning) of site

There are some situations where a variety of regulations, affecting a number of authorities, come into play.

A developer has a site, intended for future use, through which a small stream runs. The developer wishes to fill in the swampy area around the stream.

As well as checking local regulations, such as receiving approval from the municipality and conservation authority, the site developer should check with Ministry of Natural Resources. A permit may be required under the *Fisheries Act* if a fish habitat is involved or other wetland protection policies may be in place.

If all regulatory requirements have been met, inert fill could be deposited, with no record-keeping required if the fill is rock or soil. If the fill is similar to rock or soil, for instance, ash or sand from industrial processes, then records of quality analysis, waste quantity and location of placement would have to be kept for two years by the industrial producer.

If the land use is designated urban residential or urban industrial, fully serviced with sewer and water mains, then the regulations governing permit-by-rule sites come into force, with the site owner having the record keeping responsibilities.

OVERALL SUMMARY OF KEY POINTS

• Generators and receivers are responsible for correctly classifying and managing fill, even where mandatory testing and record keeping are not specified.

• Costs of sampling and analysis are the generators' responsibilities, not the Ministry's.

• inert fill - can go to any site without approval under this policy

Soil or rock

- chemical testing discretionary -- investigate site history, conduct pre-excavation or disposal inspection for visible contamination, odour, presence of previous fill or foreign matter
- no record keeping requirements

Soil-like or rock-like material

- generator required to do chemical testing and record-keeping required

• urban residential fill

- may go to any permit-by-rule site (urban residential or urban industrial)
- these sites must be fully serviced ie. water and sewer by municipal mains, and zoned for appropriate land uses
- no certificate of approval required for site
- chemical testing by generator and quantity and placement records kept for two years by receiver for soil and rock, and both generator and receiver for soil-like and rock-like materials

• urban industrial fill

- may go to any fully serviced and appropriately zoned urban industrial site or transportation corridor
- no certificate of approval required for site
- chemical testing by generator and quantity and placement records kept for two years by receiver for soil and rock, and both generator and receiver for soil-like and rock-like materials

• controlled fill

- goes to a controlled fill site
- certificate of approval required for site

• Before a receiver can accept fill at a site, approvals from and compliance with other local or provincial authorities may be required. This policy deals solely with the waste management approvals required under Regulation 309 of the *Environmental Protection Act.*

GLOSSARY

This glossary is intended to provide definitions of terms as they are used in the Materials Management Policy. The definitions found here are those that apply to the administration of the policy and may be more precise than definitions found in dictionaries for the same terms.

Background-based guidelines	guidelines whose numbers are based on typical concentrations of contaminants in existing, undisturbed soil
Controlled fill site	site for depositing material which meets the soil placement guideline for this quality of material or urban residential or urban industrial or inert fill quality, operated in accordance with a Certificate of Approval issued by the ministry under Part V of the *EPA*
Effects-based guidelines	guidelines whose numbers are determined by demonstrated adverse health effects
Generator	one who creates, or has, fill or excess materials to deposit
Grubbing materials	vegetation and natural wood materials which must be removed for construction
Land use definitions	for the purposes of this policy, the following apply:
Agricultural	area used for soil cultivation and/or animal rearing for profit, and associated residences and activities, including ancillary buildings, structures, facilities and systems
Commercial	place of business or facilities where merchandise or services can be exchanged by the general public, including hotels, retail stores, service shops and premises, public service amusements and small work shops, and offices, including government offices and administrative offices of an institution where such offices are located beyond the area where the services of the institution are primarily delivered
Community Services and Facilities	services and facilities intended primarily to service a local or district resident or working population such as elementary and secondary schools, churches and other religious facilities, day care centres, recreational, cultural and social welfare facilities, libraries, fire halls, police stations, and YMCA/YWCA or similar establishments and any office associated with such uses

Land use definitions (cont'd)

Industrial	area which includes, such uses as the assembling and storing of goods and raw materials, their processing and manufacturing, transportation and communications operations and utility premises and operations. Industrial uses may be further categorized as light, medium and heavy, according to the significance of associated adverse effects (e.g. noise, dust, odours, fumes and other air emissions from materials handling and traffic, potential health hazards due to accidents and spills, etc.)
Institutional	facilities and services provided for the use of the public or particular segments of the public on a non-profit basis, whether provided directly or indirectly by government, charitable, community, non-profit or other social agencies, and including such uses as, hospitals, post-secondary educational facilities, major public art galleries, museums and libraries, and any office associated with such uses
Open Space	area which may be a natural or man-made setting, exterior to buildings, which is accessible by the public for such purposes as walkways, sitting areas, landscaped areas, or other similar purposes and which are areas normally adjacent to and accessible from public streets, parks, walkways and other pedestrian areas
Park	defined area owned by or leased to a government which is laid out and used for active or passive public recreational uses, which may include a swimming pool, artificial ice rink, community centre, a place for large public gatherings and performances, extraordinary landscape features, a winter garden, or other similar facilities
Residential	area which contains permanent dwellings or facilities appropriate for dwelling accommodation or sleeping for an extended period of time

Land use definitions (cont'd)	
Transportation	route or means, including air, land or water, used to convey persons, goods, animals, baggage or other items from one place to another
Utility	area or corridor suitable for public services or infrastructure such as facilities for water and sewer services, natural gas pipelines, hydro conduits, transportational networks.
Leachate analysis	a procedure to chemically characterize certain wastes based on the solubility of contaminants, using standardized laboratory procedures
MDL - Method detection limits	lowest concentration which can be analyzed by a broad number of laboratories
OTR - Ontario typical range	the value or number below which 98 per cent of the results occur for the concentration of a specific organic or inorganic parameter, in soil samples collected from a single land use type from sites across Ontario
Parameter	a chemical compound or constituent of soil, rock or like material which is used to classify the material according to soil placement guidelines
Permit-by-rule site	site which does not require Certificate of Approval under Part V of the *EPA* when operated according to specific rules laid down by the ministry
Protocol	practice or recognized procedure
Putrescible	capable of rotting
Receiver	owner of site where fill is deposited
Rock	aggregation or collected mass of particles composed of one or more naturally occurring minerals; in total, more than 50 per cent of the mass by volume has a particle size greater than 2 millimetres

Rock-like material	meets the definition of rock, but need not be naturally occurring (certain industrial wastes have the potential to meet the definition of rock-like materials)
Rural	area which does not have both water and sewer services provided by mains, i.e. **either** water supplied from private well **or** sewage disposal in a septic system, or both
Site history	investigation to identify past land uses and activities at the site which may have resulted in chemical contamination of the soil, such as: any commercial or industrial activity; chemical storage or accidental spills; underground storage of fuels or chemicals and any remaining tanks; agricultural chemical use or mixing; coal liquidification or gasification; waste disposal or scrap metal or car storage; location of demolished structures such as garages, storage sheds or residences. During excavation, visual inspections should be done to identify any buried debris, unusual discolouration of the soil or presence of odours
Soil	loose or unconsolidated material resulting from the breakdown of rock or organic matter by natural physical, chemical and/or biological processes and which is capable of supporting plant growth; more than 50 per cent of the material by volume must have a particle size less than or equal to 2 millimetres
Soil-like material	meets the definition of soil but need not be capable of supporting plant growth nor be the result of natural processes (certain industrial wastes have the potential for meeting the definition of soil-like materials)
SPG - Soil placement guideline	number for a parameter which is used to classify material subject to this policy and which in turn designates the disposal options for the material
Surrogate	chemical compound which is used to estimate the behaviour or characteristics of another, similar chemical
Tipping fees	those fees charged at landfill sites to deposit, or "tip", wastes or excess materials
Urban	area which has full water and sewer services provided by mains, ie. water is not supplied by private wells nor is sewage disposed in a septic system.

Urban industrial fill site — site for depositing material which meets the soil placement guideline for urban industrial fill and operated in accordance with the specified permit-by-rule requirements. The site must have water and sewer services provided by mains and be zoned for industrial or transportation uses. Fill which meets the soil placement guidelines for urban residential or inert fill may also be placed at an urban industrial fill site.

Urban residential fill site — site for depositing material which meets the soil placement guideline for urban residential fill and operated in accordance with the specified permit-by-rule requirements. The site must have water and sewer services provided by mains and be zoned for residential, community services and facilities, commercial, institutional, open space, park or utility uses. Fill which meets the inert fill guidelines may also be placed at an urban residential fill site.

APPENDIX I

DETAILED PERMIT BY RULE APPROVALS PROCESS

APPENDIX 1
DETAILED PERMIT-BY-RULE APPROVALS PROCESS

1.0 INTRODUCTION

As part of the Ministry of the Environment's comprehensive review of the management of excess material, it was apparent that revisions to the approval process for waste disposal sites would be desirable for sites which could receive urban residential fill and urban industrial fill. This appendix describes the proposed **Permit-by-Rule** approvals process for sites which would be allaowed to accept these two fill types.

Permit-by-rule approvals are a new approach to regulation by the Ministry, which delegates responsibility to the proponent to follow explicit rules established by the Ministry. In turn the proponent is relieved of the requirement to receive site specific approval from MOE. This new approach is intended to streamline some of the Ministry's approval functions: reducing time delays for those seeking approvals and reducing workload on Ministry staff. The Ministry maintains responsibility for compliance monitoring and enforcement.

2.0 BACKGROUND

Under present regulations, all waste falls within the following general categories:

a. inert fill
b. municipal waste (ie. domestic, commercial and non-hazardous solid industrial)
c. "registerable" non-hazardous solid waste (ie. waste defined in Regulation 309 of the *EPA*, which is subjected to acid leachate tests with results from 10 to 100 times the Ontario Drinking Water Objective for a specific list of contaminants)
d. liquid industrial waste
e. hazardous waste

The existing definition of inert fill in Regulation 309 clearly contemplates that there is a category of waste which does not require stringent regulatory control as it poses no environmental risk. Uncontaminated excess soil, rock and similar material potentially falls within the inert fill category. Where contaminants are present, normal Part V, *EPA* approval requirements would apply. The existing definition, however, is difficult to interpret, resulting in an inconsistent application of Part V requirements.

Where excess soil, rock and similar material is a waste, the following approvals process for landfill sites applies:

a. Part V, *the Environmental Protection Act*

- mandatory hearing for hazardous waste or waste which is the equivalent of the domestic waste of 1500 persons
- discretionary hearing for non-hazardous waste

b. *Environmental Assessment Act*

- *EAA* approval required if material is hazardous waste or the equivalent of the domestic waste of 1500 persons
- *EAA* approval required if site size is greater than 40,000m^3

This approvals process makes little provision for an excess material such as soil which, although considered to be a waste, presents minimal environmental concern.

In keeping with the ministry's initiatives to reduce waste and deal with an increasing demand for environmentally acceptable waste disposal facilities, alternate mechanisms for the management of excess soil, rock and similar material are proposed. An essential aspect of any management alternative will be the level of and process for regulatory control.

3.0 PROPOSED APPROVALS PROCESS

3.1 Principles

The following principles have been used in the development of the proposal for a revised approvals process for soil, rock and similar material:

a. maintain environmental integrity (short and long term) of site receiving excess material

b. provide for public involvement where potential for environmental effects may be significant

c. develop a simple process

d. ensure timely processing of applications

e. develop an order of approval requirements which reflect the level of potential environmental concern

f. limit amendments to those requiring administrative or regulation change as basic requirements of EPA and EAA are fundamentally sound

g. place responsibility on both generators and receivers of excess material for proper management of the material in accordance with legislative requirements

h. ensure the process is enforceable

3.2 Overview of proposed approvals process

The proposed approvals process for the management of excess soil, rock and similar material is summarized below and in Tables I-1, I-2 and I-3.

The proposed approvals process involves the establishment of three new waste site categories for soil, rock and similar material. Excess material which meets specific quality criteria may be placed in new Urban Residential Fill, Urban Industrial Fill and Controlled Fill sites. The revised Inert Fill category found in Regulation 309 will continue to be an exempted waste which can be placed virtually anywhere fill is required without waste management approvals from the ministry.

The generator will be responsible for determining what analysis is necessary when the inert fill originates from excess native soil or rock, to properly classify and manage his material. The receiver of that material also is responsible for accepting material which is accurately classified. In determining what analysis may be required, some of the things the generator should consider are: the history of land use at the site; visible staining of the soil, odor, and the presence of existing fill material.

To classify excess soil-like or rock-like material (ie. excess material, such as slag or foundry sand, which originates from an industrial process) as inert fill, mandatory testing and record-keeping by the generator is required by the proposed policy.

To classify excess soil, rock and similar material as urban residential fill, urban industrial fill and controlled fill, mandatory testing and record-keeping will be required.

The proposed approvals process for urban residential fill sites and urban industrial fill sites involves a permit-by-rule approach and includes quality limits for the fill material. To determine what mandatory chemical testing is required, the generator must consider the land use at the originating site, or, in the case of soil-like or rock-like material, the industrial process. To determine where a classified urban residential or urban industrial fill material can be placed, the receiver must have the appropriate land use designation at the receiving site. Under the proposed policy, these sites are to be exempt from the *EAA* and from requiring Part V, *EPA* landfill certificates, provided the permit-by-rule requirements as listed in subsection 3.4 are met.

Controlled fill sites also are proposed as exempt from the *EAA* but would still require landfill certificates under Part V of the *EPA* as listed in subsection 3.5.

Regulatory amendments are required to allow implementation of the proposed approvals process.

3.3 Inert fill

A revised definition of inert fill is proposed to be included in the regulatory amendments. Excess soil, rock and similar material, which is classified as inert fill, is to be exempt from Part V of the *EPA* and may be deposited at any site without ministry waste management approvals. Testing and record keeping is proposed only for excess soil-like and rock-like material, resulting from industrial processes. The ministry's role in auditing the quality of material being moved as inert fill would be handled by normal abatement and enforcement methods.

a. Inert fill definition

Inert fill is defined as excess soil, rock or similar (like) material meeting the chemical characterization limits shown in Table 3-1 and 3-1-1.

Notes:

- defines quality criteria for inert fill

b. Quality analysis requirements

Quality analysis, as scheduled, is required by each generator of excess soil-like and rock-like material which is to be placed at a site as inert fill.

Notes:

- requires analysis to be carried out by generators of excess soil-like and rock-like material
- specific analysis is not set out for generators of excess soil and rock; however the generator and receiver are responsible for accurately classifying their excess soil or rock.

c. Record Keeping - Generator

Each generator of excess soil-like and rock-like material (but not soil and rock) which is to be placed at a site as inert fill shall keep a copy of each record of analysis, a record of the quantity of fill and a record of the location of placement and shall retain these records for 2 years following completion of placement.

Notes:

- requires generator of excess soil-like and rock-like material to retain records of quality analysis, quantity and location of placement for two years

3.4 Urban residential fill and urban industrial fill

Excess soil and rock, rock and similar material to be deposited at urban residential fill and urban industrial fill sites are proposed exempted from the EAA and Sections 27 and 45 of the EPA provided the requirements listed below are met. Testing and record keeping is required for these sites.

a. Urban residential fill definition

Urban residential fill is defined as excess soil, rock or like material meeting the chemical characterization limits (refer to Section 3.2, Tables 3-1 and 3-1-1).

Notes:

- defines quality criteria for urban residential fill

b. Urban industrial fill definition

Urban industrial fill is defined as excess soil, rock or like material meeting the chemical characterization limits (refer to Section 3.2, Tables 3-1 and 3-1-1).

Notes:

- defines quality criteria for urban industrial fill

c. Land use groups

For purposes of urban residential fill and urban industrial fill sites, land uses are defined and grouped by environmental sensitivity as shown in Table I-4).

Notes:

- land uses to be defined and grouped by environmental sensitivity for purposes of the placement of fill

d. Proposed *EAA* exemption

The placement of excess soil, rock or like material in urban residential fill or urban industrial fill sites is exempt from the *EAA*.

Notes:

- EA exemption proposed for urban residential fill and urban industrial fill sites

e. Proposed *EPA* exemption

The placement of excess soil, rock or like material in urban residential fill or urban industrial fill sites is exempt from Sections 27 and 45 of the *EPA*.

Notes:

- exemption from requirement to obtain a landfill certificate of approval for urban residential fill and urban industrial fill sites proposed
- exemption from requiring Minister's approval for use of former waste disposal site proposed

f. Urban residential fill site

Excess soil, rock or like material may be placed at a site in the urban residential land use group provided it meets the quality criteria for urban residential fill.

Notes:

- allows placement of fill meeting quality criteria for urban residential fill at site in urban residential land use group

g. Urban industrial fill site

Excess soil, rock or like material may be placed at a site in the urban industrial land use group provided it meets the quality criteria for urban industrial fill.

Notes:

- allows placement of fill meeting quality criteria for urban industrial fill at site in urban industrial land use group

h. Quality analysis requirements

Quality analysis is required by each generator of excess soil, rock or like material which may be placed at an urban residential fill or urban industrial fill site, as listed below:

1. soil or rock analysis is required from a generator in the industrial land use groups, urban or rural, as listed (Table I-3(ii)).

2. soil or rock analysis is required from a generator in the urban residential or the rural land use groups, other than rural industrial, as listed (Table I-3(i)).

3. soil-like or rock-like material must be analysed, as listed (Table I-3(ii)).

Notes:

- requires analysis to be carried out by all generators of permit-by-rule fill to confirm fill quality.

i. Record keeping - receiver

Each owner of an urban residential fill site or an urban industrial fill site, when receiving excess soil, rock or like material, must obtain a copy of each generator's record of analysis; the site owner also must keep a record of the quantity of fill and where it was placed and retain these records for two years following the completion of the deposit.

Notes:

- requires all receivers of excess soil, rock or like material to retain records of quality analysis, quantity and location of placement for two years

j. Record keeping - generator

Each generator of excess soil-like or rock-like material (but not soil or rock) to be placed at an urban residential or urban industrial fill site must keep a copy of each record of analysis and must obtain a copy of the receiver's records of the quantity of fill and where it was placed and must keep these records for two years following the completion of fill deposit.

Notes:

- requires generator of excess soil-like or rock-like material to retain records of quality analysis, quantity and location of placement for two years
- generator of excess soil or rock not required to retain records

k. Small quantity exemption - urban residential fill

An exemption from quality analysis and record keeping is given to the generator and receiver when a small quantity - less than 150 m^3 - of excess soil or rock (but not soil-like or rock-like material) is to be placed in an urban residential fill site. However the excess soil or rock must have been generated at a site in the urban residential or rural land use groups (other than rural industrial), the fill to be placed must not be known or suspected of being contaminated and the generator's site must not have been previously used for industrial or commercial purposes.

Notes:

- exemption from quality analysis and record keeping for excess soil to be managed as urban residential fill
- exemption does not apply if generator's site is contaminated or has been used for industrial or commercial purposes

l. Small quantity exemption - urban industrial fill

(i) An exemption from quality analysis and record keeping is given to the generator and receiver when a small quantity - less than 150 m^3 - of excess soil or rock (but not soil-like or rock-like material) is to be placed in an urban industrial fill site. However the excess soil or rock must have been generated at a site in the urban residential or rural land use groups (other than rural industrial), the soil to be placed must not be known or suspected of being contaminated and the generator's site must not have been used for industrial or commercial purposes.

(ii) An exemption from quality analysis and record keeping is given to the generator and receiver when a small quantity - less than 30 m^3 of excess soil or rock (but not soil-like material) - is to be placed at an urban industrial fill site and the excess soil has been generated at a site in the industrial land use groups (urban or rural), or in any other land use category if the site of origin has been previously used for industrial or commercial purposes, and provided the soil to be placed is not known or suspected of being contaminated.

Notes:

- exemption from quality analysis and record keeping for excess soil or rock to be managed as uurban industrial fill
- 150 m^3 exemption given where generated from non-industrial land uses
- 30 m^3 exemption given where generated from industrial or commercial land uses

m. Onsite exemption

Excess soil or rock (but not soil-like or rock-like material) and vegetative growth at deposited within the generation site are exempt from the chemical characterization limits and record keeping required for urban residential and urban industrial fill sites provided the soil quality meets the ministry's decommissioning guidelines.

Notes:

- provides exemption from quality limits and record keeping for onsite movement of soil (and vegetation) provided soil quality meets the decommissioning guideline
- quality analysis still required unless the material is assessed as inert fill or is exempt as a small quantity

n. Hauler exemption

The transportation of Urban Residential Fill or Urban Industrial Fill is exempt from Section 27 of the *EPA* Act.

Notes:

- vehicles hauling excess soil, rock and like material to urban residential and urban industrial fill sites are exempt from requiring Part V, *EPA* approval

3.5 Controlled fill

Excess soil, rock or like material which is to be deposited at a landfill site (other than a site on land covered by water) is proposed as exempt from the *EAA* and from Section 30 of the *EPA* with the following conditions:

a. Controlled fill definition

Controlled fill is defined as excess soil, rock or like material meeting the chemical characterization limits as listed.

Notes:

- defines quality criteria for controlled fill

b. Proposed *EAA* exemption

The landfilling of controlled fill at a site other than on land covered by water is exempt from the *EAA*.

Notes:

- EA exemption proposed for controlled fill sites

c. Mandatory hearing exemption

The landfilling of controlled fill at a site other than on land covered by water is exempt from Section 30 of the *EPA*.

Notes:

- mandatory *EPA* hearings not to be required
- discretionary hearing under *EPA* may be held

4.0 RATIONALE FOR PROPOSED APPROVALS PROCESS

4.1 Level of regulatory control

There are a number of alternatives for regulatory control of waste management activities:

1. no approval
2. permit-by-rule
3. Part V, *EPA*
4. *EAA*

For soil, rock and similar material not considered to be inert fill, the existing approvals process involves alternatives 3 and 4. This process requires technical evaluation, public involvement and approval of proposed receiving sites (ie. landfills) on a site specific basis. The alternative approvals process being proposed for these materials in this report includes a combination of alternatives 2 and 3. The pros and cons of the proposed process are as follows:

PROS:
- more timely process
- any significant environmental impacts addressed
- provides for public input (ie. discretionary hearing), site specific technical evaluation and Part V approval of controlled fill sites

CONS:
- no formal public input, site specific technical evaluation or Part V approval for urban residential and urban industrial fill sites

4.2 Technical requirements in the approvals process

The potential environmental impacts from the management of waste such as excess soil, rock and similar material include the following:

a. contaminants in material or migrating from deposited material, can cause multi-media health/environmental exposure and effects from/to:
   - ground water

- surface water
- soil ingestion
- terrestrial ecosystem

b. altered physical integrity of receiving site with effects on
   - stability
   - safety

c. operational activities at receiving sites can cause impacts
   - dust
   - noise
   - traffic

Some of these impacts may also occur in situations where clean material (ie. inert fill) is being used as fill.

There are a number of alternate approaches to dealing with technical requirements in an approvals process:

1. performance standards
2. design standards
3. management of effects (ie. land use control)

The system for granting certificates of approval for landfill sites in Ontario currently is based on performance standards (eg. Reasonable Use Policy) rather than design standards. The use of a design standard approach does not account for site specific circumstances.

4.3 Urban residential and urban industrial fill sites

Within the approvals process proposed for these categories of fill material, there are a number of matters to be considered:

a. Small quantity exemptions

Exemptions from quality analysis and record keeping are recommended for small quantities based on the following:

- potential environmental impacts of small quantities are minimal
- less costly process for small generators and receivers

Limits for the exemptions given for urban residential fill are based on the approximate volume of a typical house excavation (ie. 150 m^3). The urban industrial fill exemption limit is set at a fraction of this volume (ie. 30 m^3) because of the greater potential for contaminated soil at industrial or commercial properties.

b. Chemical classification guidelines

The quality criteria defining the two fill categories (following subsection 3.4, clauses a. and b.) is described in Section 3 of the main body of this report.

c. Quality analysis requirements

The quality analysis requirements for generators (following subsection 3.4, clause h) is described in Section 3 of the main body of this report.

d. Record keeping

A number of alternatives were considered in assessing record keeping requirements for these fill sites:

1. registration on title
2. ministry keeps records
3. receiver/generator keep records
4. no record keeping

It is recommended that records be kept by the receiver of the excess soil, rock and like material (and the generator for soil/rock-like material) on the following basis:

- records are kept for two years to assist ministry abatement activities
- responsibility for record keeping is with the owner of the receiving site (and with the generator for soil/rock-like material)
- no resource requirements for ministry
- less onerous record keeping procedure for receivers than registration on title
- proposed land use changes of former fill sites can be dealt with by the ministry through land use planning review process

This recommended procedure, however, will not provide a permanent record of the fill site; changes in site ownership may result in the loss of records before the two-year period expires.

e. Land use definitions

As the rules for the fill sites are based in part on land use, there is a need to define land uses for purposes of regulatory interpretation. Land use terms and designations defined by individual municipalities may differ from the regulation; therefore an interpretation of the definitions will be necessary during implementation. The glossary in the main body of the report provides proposed definitions of land use for the purposes of this policy.

4.5 Controlled fill sites

The quality criteria defining the controlled fill category (following subsection 3.5, clauses a.) is described in Section 3 of the body of this report.

4.6 Inert fill definition

As part of the proposed regulatory amendments, an improved definition for inert fill (and definitions for the new terms soil, rock and similar material) is required. The new definition should include a qualitative description and specific quality criteria. To supplement the ministry's ability to carry out abatement activities, testing and record keeping requirements are proposed for excess soil/rock-like material from industrial processes which is to be handled as inert fill. These requirements are not considered necessary or practical for the handling of excess soil/rock as inert fill.

TABLE I-1: APPROVALS - CHEMICAL TESTING REQUIREMENTS

PROPOSED REG. 309 AMENDMENTS	QUALITY OF FILL	ORIGIN OF EXCESS MATERIAL					
		SOIL/ROCK					SOIL/ROCK LIKE MATERIAL
		RURAL GROUP			URBAN RESIDENTIAL GROUP	URBAN INDUSTRIAL GROUP	
		All rural except rural agriculture, rural transport corridor and rural industrial	Rural agriculture	Rural industrial	All urban except urban industrial, and urban transport corridor	Urban industrial, urban transport corridor, and rural transport corridor	
MINIMUM TESTING REQUIREMENTS TO BE SPECIFIED IN REG. 309	INERT FILL	NO[a]	NO[a]	NO[a]	NO[a]	NO[a]	YES[a,c]
	URBAN RESIDENTIAL FILL	YES[a,b]	YES[a,b,d]	YES[a,c]	YES[a,b]	YES[a,c]	YES[a,c]
	URBAN INDUSTRIAL FILL	YES[a,b]	YES[a,b,d]	YES[a,c]	YES[a,b]	YES[a,c]	YES[a,c]

a -The generator and receiver are responsible for accurately classifying and managing these materials. Additional testing is required in all cases where contamination is known or suspected.

b - Table 3-3(i) Mandatory chemical parameter list

c - Table 5-3(ii) Mandatory chemical parameter list

d - History of origins of material to also consider pesticide use.

TABLE I-2: APPROVALS - RECORD KEEPING

PROPOSED REG. 309 AMENDMENTS	QUALITY OF FILL	ORIGIN OF EXCESS MATERIAL					
		SOIL/ROCK					SOIL/ROCK LIKE MATERIAL
		RURAL GROUP			URBAN RES. GROUP	URBAN IND. GROUP	
		All rural except rural agriculture, rural transport corridor and rural industrial	Rural Agriculture	Rural Industrial	All urban except urban industrial, and urban transport corridor	Urban industrial, urban transport corridor, and rural transport corridor	
RECORD KEEPING	INERT FILL	NO	NO	NO	NO	NO	YES (G)
	URBAN RESIDENTIAL FILL	YES (R)	YES (R)	YES (R)	YES (R)	YES (R)	YES (G,R)
	URBAN INDUSTRIAL FILL	YES (R)	YES (R)	YES (R)	YES (R)	YES (R)	YES (G,R)

G = Generator
R = Receiver

TABLE I-3: APPROVALS - EXEMPTIONS

PROPOSED REG. 309 AMENDMENTS	QUALITY OF FILL	ORIGIN OF EXCESS MATERIAL					
		SOIL/ROCK					SOIL/ROCK LIKE MATERIAL
		RURAL GROUP			URBAN RESIDENTIAL GROUP	URBAN INDUSTRIAL GROUP	
		All rural except rural agriculture, rural transport corridor and rural industrial	Rural agriculture	Rural industrial	All urban except urban industrial, and urban transport corridor	Urban industrial, urban transport corridor, and rural transport corridor	
SMALL QUANTITY EXEMPTIONS[a,b]	INERT FILL	-	-	-	-	-	NO
	URBAN RESIDENTIAL FILL[b]	150 m^3	150 m^3	NO	150 m^3	NO	NO
	URBAN INDUSTRIAL FILL[c]	150 m^3	150 m^3	30 m^3	150 m^3	30 m^3	NO
ON-SITE EXEMPTION[a,d]	FILL REMAINS ON-SITE	YES	YES	YES	YES	YES	NO

a - Does not apply where contamination is known or suspected.
b - 150 m^3 exemption does not apply if land of origin has been previously used for industrial purposes.
c - Exemption reduced from 150m^3 to 30m^3 if land of origin has been previously used for industrial purposes.
d - On-site exemption applies provided quality meets decommissioning guidelines.

Table I-4
Acceptable Destination Land Uses
for Disposal of Fill Materials

Quality of Fill	Acceptable land uses for destination sites[a]		
	RURAL GROUP	URBAN RESIDENTIAL GROUP	URBAN INDUSTRIAL GROUP
	All rural, including rural agriculture and rural industrial, except transportation corridors[b]	All urban land uses except urban industrial and urban transportation corridor[b]	Urban industrial, rural and urban transportation corridors[b]
Inert fill	———	———	———
Urban residential fill		———	———
Urban industrial fill			———

[a] Sensitivity of land use groups decreases from left to right in the table

[b] See Glossary for further description of land use activities included

Table 3-1: Soil Placement Guidelines for Mandatory Testing List - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Inorganics				
Antimony	0.43	0.43	0.86	200
Arsenic	11	17	20	200
Barium	160	180	360	7500
Beryllium	1.1	1.1	2.2	40
Cadmium	0.71	0.84	1.7	30
Chromium VI	0.5	0.5	1	80
Chromium (total)	58	62	120	7500
Cobalt	16	17	34	400
Copper	41	65	130	1500
Lead	45	98	200	2000
Mercury	0.13	0.18	0.36	8
Molybdenum	1	1	2	50
Nickel	38	38	76	1500
Selenium	0.93	1.3	2	20
Silver	0.27	0.33	0.66	200
Vanadium	77	77	150	2000
Zinc	120	140	280	6000
E.C. (mS/cm)	0.36	0.57	0.7	2.5
S.A.R. (units)	0.7	1.4	3	25
pH (range in units)	3-10	3-10	3-10	2-12
Organics				
VOCs				
Benzene	**0.002**	**0.002**	0.004	0.5
Toluene	**0.002**	**0.002**	0.004	10
Xylene	**0.002**	**0.002**	0.004	10
Methylene Chloride (Dichloromethane)	**0.003**	**0.003**	0.006	0.1
Carbon tetrachloride	**0.002**	**0.002**	-	0.04
Trichlorofluoromethane	0.012	0.013	-	0.26
Ethylene dichloride (1,2-dichloroethane)	**0.002**	**0.002**	0.004	0.15
1,1,1-trichloroethane	0.005	0.005	0.01	40
Trichloroethylene	**0.004**	**0.004**	0.008	0.7
Tetrachloroethylene	**0.002**	**0.002**	0.004	0.8
PAHs				
Benzo(a)pyrene	**0.05**	0.81	1	10
Benzo(a)anthracene	0.05	0.69	1.4	40
Dibenz(a,h)anthracene	**0.1**	0.36	0.72	9
Benzo(g,h,i)perylene	**0.1**	0.6	1.2	40
Fluoranthene	0.14	1.6	3.2	40
Naphthalene	**0.05**	0.09	0.18	40
Phenanthrene	0.092	1.4	2.8	40
Pyrene	0.11	1.2	2.4	40
PCBs				
Total	**0.3**	**0.3**	0.6	25
Phenolics				
p-cresol	**0.1**	**0.1**	-	2
2,4-dichlorophenol	**0.1**	**0.1**	-	2
2,4,6-trichlorophenol	**0.1**	**0.1**	-	2
Pentachlorophenol	**0.1**	**0.1**	-	2

Numbers in bold indicate values are method detection limits [MDLs (i.e. OTR96 Values were below MDL, hence MDL is used)]. Refer to Section 3.1.

Table 3-1-1: Additional Soil Placement Guidelines - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Organics				
Dioxins and furans (ng TEQ/g or parts per billion)	0.005	0.005	0.01	10
VOCs				
Styrene	**0.002**	**0.002**	-	0.04
Ethylbenzene	**0.002**	**0.002**	0.004	5
Chlorbenzene	**0.002**	**0.002**	0.004	30
1,4-dichlorobenzene	**0.002**	**0.002**	0.004	30
1,2-dichlorobenzene	**0.002**	**0.002**	-	0.04
1,3-dichlorobenzene	**0.002**	**0.002**	-	0.04
Chloroform (Trichloromethane)	0.002	0.0026	0.005	20
Ethylene dibromide (1,2-dibromoethane)	0.002	0.002	0.002	0.02
Vinyl Chloride (Chloroethylene)	**0.003**	**0.003**	0.006	0.09
1,1-dichloroethylene	**0.002**	**0.002**	0.004	0.2
Trans 1,2-dichloroethylene	**0.003**	**0.003**	0.006	3.3
Chloromethane	**0.003**	**0.003**	-	0.06
Bromomethane	**0.003**	**0.003**	-	0.06
dibromochloromethane	**0.003**	**0.003**	-	0.04
Bromoform (Tribromomethane)	**0.002**	**0.002**	-	0.04
1,1-dichloroethane	**0.002**	**0.002**	-	0.04
1,1,2-trichloroethane	**0.002**	**0.002**	-	0.08
1,1,2,2-tetrachloroethane	**0.004**	**0.004**	-	0.04
1,2-dichloropropane	**0.002**	**0.002**	-	0.04
Cis-1,3-dichloropropylene	**0.002**	**0.002**	-	0.04
Trans 1,3-dichloropropylene	**0.003**	**0.003**	-	0.06
PAHs				
1-methyl napthalene	**0.05**	0.09	0.18	40
2-methyl napthalene	**0.05**	0.11	0.22	40
Anthracene	**0.05**	0.23	0.46	40
Chrysene	0.1	0.94	1.9	40
Benzo(b)fluoranthene	0.15	1.6	3.2	40
Indeno(1,2,3-cd)pyrene	**0.1**	0.46	0.92	40
1-chloronaphthalene	**0.05**	**0.05**	0.1	40
2-chloronaphthalene	**0.05**	**0.05**	0.1	40
Fluorene	**0.05**	0.14	0.28	40
Perylene	**0.05**	0.37	0.74	40
Acenaphthene	**0.05**	0.16	0.32	40
5-nitro acenaphthene	**0.05**	**0.05**	0.1	40
Acenaphthylene	0.093	0.096	0.19	40
Indole	0.1	0.1	-	2
Camphene	**0.05**	0.054	-	1.1

Table 3-1-1: Additional Soil Placement Guidelines - Bulk Analysis (ug/g or parts per million)

Parameter	Inert fill	Urban residential fill	Urban industrial fill	Controlled fill
Phenolics				
2,4-dinitrophenol	**0.2**	**0.2**	-	4
Phenol	**0.1**	**0.1**	-	2
m-cresol	**0.1**	**0.1**	-	2
o-cresol	**0.1**	**0.1**	-	2
2,4-dimethylphenol	**0.2**	**0.2**	-	4
4-nitrophenol	**0.2**	**0.2**	-	4
4-chloro-3-methylphenol	**0.1**	**0.1**	-	2
2-chlorophenol	**0.1**	**0.1**	-	2
4,6-dinitro-o-cresol	**0.1**	**0.1**	-	2
2,6-dichlorophenol	**0.1**	**0.1**	-	2
2,3,4-trichlorophenol	**0.1**	**0.1**	-	2
2,3,5-trichlorophenol	**0.1**	**0.1**	-	2
2,4,5-trichlorophenol	**0.1**	**0.1**	-	2
2,3,4,5-tetrachlorophenol	**0.1**	**0.1**	-	2
2,3,4,6-tetrachlorophenol	**0.1**	**0.1**	-	2
2,3,5,6-tetrachlorophenol	**0.1**	**0.1**	-	2
Pesticides				
Aldrin	**0.05**	**0.05**	-	0.35
Carbaryl	**0.05**	**0.05**	-	1
a-Chlordane	**0.05**	**0.05**	-	1
g-Chlordane	**0.05**	**0.05**	-	1
DDT	0.078	1.4	1.4	4
2,4-D	**0.1**	**0.1**	-	2
Diazinon	**0.05**	**0.05**	-	1
Dieldrin	**0.05**	**0.05**	-	1
Endrin	**0.05**	**0.05**	-	0.06
Heptachlor	**0.05**	**0.05**	-	1
Heptachlor epoxide	**0.05**	**0.05**	-	1
Lindane	**0.05**	**0.05**	-	1
Methoxychlor	**0.05**	**0.05**	-	1
Methyl Parathion	**0.05**	**0.05**	-	1
Parathion	**0.05**	**0.05**	-	1
Silvex	**0.1**	**0.1**	-	2
Toxaphene	**1**	**1**	-	2
Inorganics				
Aluminium	30000	30000	-	600000
Boron	30	30	-	600
Cyanide	0.02	0.05	-	1
Chloride	45	220	-	4400
Iron	35000	35000	-	700000
Fluoride	61	61	-	1200
Magnesium	20000	20000	-	400000
Manganese	2200	2200	-	44000
Nitrate & Nitrite	30	44	-	880
Strontium	78	78	-	1600
Sulphur	790	970	-	19000
Titanium	5200	5200	-	100000
Thallium	0.81	0.81	-	16
Uranium	2.1	2.1	-	42

Numbers in bold indicate values are method detection limits [MDLs (i.e. OTR98 Values were below MDL, hence MDL is used)]. Refer to Section 3.1.

Table 3 - 3: Mandatory chemical parameter list

(i) Material of residential and rural (non-industrial/commercial) origin

Inorganics	
Antimony	Mercury
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium VI	Vanadium
Chromium (total)	Zinc
Cobalt	Electrical Conductivity
Copper	Sodium Absorption Ratio
Lead	pH

Plus
Any elements or compounds which an examination of the history of origins of the material indicate are likely to be of concern.

(ii) Material of industrial/commercial origin

Inorganics	
Antimony	Mercury
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium VI	Vanadium
Chromium (total)	Zinc
Cobalt	Electrical Conductivity
Copper	Sodium Absorption Ratio
Lead	pH
VOCs	
Benzene	Trichlorofluoromethane
Toluene	Ethylene dichloride
Xylene (total)	1,1,1-trichloroethane
Methylene chloride	Trichloroethylene
Carbon tetrachloride	Tetrachloroethylene
PAHs	
Benzo(a)pyrene	fluoranthene
dibenz(a,h)anthracene	phenanthrene
benzo(a)anthracene	napthalene
benzo(g,h,i)perylene	pyrene
PCBs	
Total PCBs	
Phenols	
2,4,6-trichlorophenol	p-cresol
2,4-dichlorophenol	pentachlorophenol

Plus
Any elements or compounds, which an examination of the history of origins of the material indicate, are likely to be of concern

APPENDIX II

GENERIC CLASSIFICATION

APPENDIX II
DEVELOPMENT OF GENERIC WASTE CLASSIFICATIONS

INTRODUCTION

All waste materials which require management (treatment, disposal, 3Rs approaches) can be classified into a series of categories, ranging from hazardous to non-wastes. An approach, similar to that in Regulation 309, is to classify these materials by listing or testing them. Lists of wastes whose characteristics are relatively homogeneous and consistent will be put into the revised regulation. These wastes (termed "generic") will be sorted into schedules, tables or lists according to class. Once the materials are classified, the options for managing them are apparent.

If a waste appears on a generic list, its class is specified and neither chemical nor physical testing need be performed. This should result in significant savings in time and in analytical costs for generators of excess materials.

Initial generic listings will be prepared by the MOE. If a waste generator, or group of generators, wish a specific waste stream to be a listed generic waste, a detailed proposal can be submitted to the MOE for consideration.

DESCRIPTION OF GENERIC LISTING PROCESS

The following explanations and Figure II-1 (Generic Listing Flowchart) provide the details of the process to be followed by a generator requesting a generic waste listing.

Explanation 1: Selection of generic listing

At this point, the generator has selected the generic listing approach for managing the waste or excess material.

To begin the process, the generator should inform MOE (regional office) of the intent to list a specific waste stream. The regional officer will be able to recommend further action to be taken, involving possible participation of others generating the same waste, and co-ordination by MOE.

Explanation 2: Multi-source listing

When a waste is proposed for generic listing, the listing would include wastes being produced from similar sources or industries in Ontario. Consequently the generator who initiated the listing document may not be the only person affected by the listing. As well as plants and industries, there may be associations representing groups of affected industries.

In any case, MOE will be responsible for co-ordinating the efforts of the different groups (industries, associations, and other agencies) in preparing the listing document.

Explanation 3: Generator's document

If the waste is generated only by a single person, in a quantity large enough to justify generic listing, then the generator is the only person responsible for preparing the listing document (with the assistance of MOE staff).

In order to list a waste as a generic waste in the schedules of Regulation 309, the generator must prepare a listing document, which will characterize a specific waste stream and justify the need for listing such a waste as generic waste.

The document must include the following information:

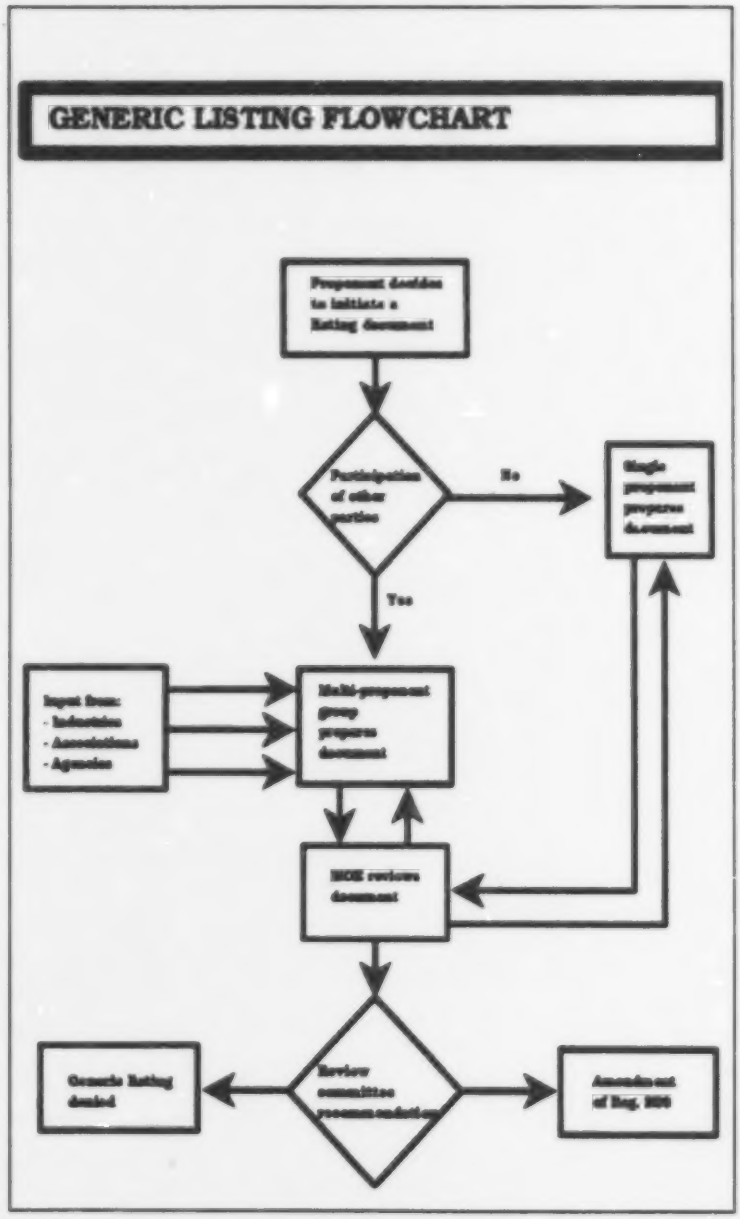
1. **General industrial process**

A review of the industrial sector should identify the general process responsible for generating the waste. The objective of this review is to identify variations in the general process from one plant to another, from one region of Ontario to another, or from other provinces and states. The extent of the industry and the relative importance of this industrial sector in the generation of non-hazardous wastes should be addressed.

2. **Waste generation process**

A comprehensive review of the waste generation process (which is specific for the waste subject to listing) should be included in the application. The objective of this review is to define the variations of the process which may generate wastes with characteristics different from the ones of the listed waste.

FIGURE II - 1



Variations in the characteristics of the waste may be due to variations in characteristics of the raw materials used, variations in the equipment used, or variations in the conditions of operation (e.g. temperature, pressure, time, etc.).

3. **Waste composition**

A proper characterization of the generic waste relies on developing and implementing a representative sampling program. Because of the nature of generic listing, any variations in the quality of the waste must be identified, and monitored if possible. The variations should be explained in terms of normal process variations, process upsets (e.g. slowdown, shutdown, restart, warmup, etc.) or variations in the composition of the raw or manufactured materials.

3.1 **Sampling program**

A description of the sampling program and sampling techniques used should be detailed. It is important that each sample be well identified in terms of sampling location, date and type of waste (sludge, granules, soil type, etc). A brief review of the sampling techniques, frequency of sampling and number of samples is presented at the end of this appendix

3.2 **Analytical methods**

The analytical methods used in the sampling program should be identified and described.

3.3 **Physical characteristics**

The physical characteristics include those which may be pertinent to management of the waste and to the conditions of the disposal site.

3.4 **Chemical characteristics**

The chemical characterization of the waste, as represented by both bulk and leachate analyses, must be included in the application document.

4. **Interpretation and recommendation**

The generator needs to demonstrate, through review and interpretation of the sampling results, that the waste is homogeneous and consistent within the specified waste stream.

The generator should recommend in the document the wording for the generic waste listing to appear in the schedules of Regulation 309.

Explanation 4: Multi-generator group prepares document

Once it has been determined that the waste stream may be generated by a number of other industries or plants in Ontario, the listing document must be prepared in co-operation with these affected groups.

The MOE will create a committee representing the industries and the associations of the industrial sector affected, which will prepare the listing document. The responsibility of the industries and/or associations will be to provide information (description of waste generation processes) and data (results of waste sampling). Various agencies (provincial, federal or USEPA) may provide additional information, if available. MOE will co-ordinate the efforts.

Explanation 5: Review of document

Once the listing background document has been prepared, a review committee will study the document before recommending or rejecting amendment of Regulation 309.

During the review process, the committee may require clarification or additional information from the generator (either the single generator or the multi-generator group).

SAMPLING PROTOCOL TO GENERICALLY LIST MATERIALS

The sampling protocol to generically list materials as described below, is an expansion of the sampling protocol which has been developed for this policy. The general sampling protocol is described in the document entitled "Sampling, Processing and Analytical Protocols for Bulk Chemical Characterization of Soils, Rocks and Like Materials", prepared by the Ministry of the Environment Air Resources Branch.

Number of samples

A sufficient number of samples must be taken to ensure that the results are representative of the bulk of the material. The number taken will be a multiple of the number required for non-generic materials. Unless otherwise specified, the number of samples will be twice the number required for a non-generic material being produced under similar conditions.

Frequency of sampling

The frequency of sampling over time will have to be increased above the frequency specified for non-generic materials to establish that the characteristics of a material to be listed in the regulation do not change appreciably over time. Sampling similar to that for non-generic material should be performed initially and then repeated monthly for an additional two months for a total of three sampling periods each one month apart.

Sampling method/location of sample sites

These considerations are the same for generic materials as they are for non-generic materials. Reference should be made to suggested sampling methods elsewhere in this document. It will, however, be necessary for the generator to discuss these matters with the MOE to ensure that there are no unusual considerations.

Number of sites with similar operations

The generator may represent a company or organization with one site or multiple sites (which may have excess material to be managed with similar characteristics). It must be determined whether the operations from which the material is derived are the same at the multiple sites, since a generic listing in the regulation means that sampling at each site will not be required. Confirmatory sampling and analyses will be required, at the sites which will not be performing the full range of generic sampling, to demonstrate that the materials have similar characteristics.

GENERIC CLASSIFICATION OF EXCESS ROAD CONSTRUCTION AND MAINTENANCE MATERIALS

In addition to the generic listing process described above, the ministry is also considering generically classifying some types of materials such as those generated by road construction activities. Comment is sought particularly on this proposal. The description that follows is a possible scenario for such a classification procedure.

Waste or excess materials generated from road construction and maintenance activities can generally be categorized as follows:

- Recyclable material
- Inert fill
- Waste

The Table II-1 sets out the proposed classification schedule for these materials in detail.

TABLE II - 1 OPTION FOR GENERIC CLASSIFICATION OF ROAD CONSTRUCTION AND MAINTENANCE MATERIAL

MATERIAL DESCRIPTION	PROPOSED CLASSIFICATION
A. Road Construction Material	
1. Management within right-of-way	
- natural wood/vegetation - soil and rock - used concrete - used asphalt	- on-site exemption (unless significant[1] contamination suspected)
2. Management within construction area[2,3]	
- natural wood/vegetation	- on-site exemption subject to quantity limit[4] (eg. limit to 3 roadway segments of accumulated material within any single roadway segment)
- soil and rock - used concrete	- on-site exemption (unless significant contamination suspected)
- used asphalt	- potential use in engineered construction applications under recyclable material definition[5]; otherwise designated as controlled fill for disposal on land
3. Management outside construction area	
- natural wood/vegetation	- municipal waste, potential for recyclable material (ie. compost, wood chips, etc.)
- soil and rock - used concrete	- follow general rules of classification
- used asphalt	- potential use in engineered construction applications under recyclable material definition; otherwise designated as controlled fill for disposal on land
B. Road maintenance material	
1. Road sweepings	- on-site exemption (unless significant contamination suspected)
i) within right-of-way	
ii) outside right-of-way	- follow general rules for classification (possibly municipal waste)
2. Catch basin material	- follow general rules for classification (possibly municipal waste)

1 Significant contamination level to be defined.

2 Management within construction area subject to permission of property owner.

3 "Construction area" to be defined but includes right-of-way and part of adjacent properties.

4 Quantity limit to be defined; one roadway segment is equal to the width of the right-of-way.

5 Consideration being given by Waste Reduction Office, Ministry of Environment to amending recyclable material definition to include engineered construction applications.

APPENDIX III

SCHEDULE OF SUITABLE SOIL, ROCK & LIKE MATERIALS FOR CLASSIFICATION

APPENDIX III
MATERIALS SUITABLE FOR CLASSIFICATION

The Materials Management Policy is intended to cover excess soil, rock and similar materials which are suitable for placement as **fill** material. The chemical analysis protocols and classification lists have been developed to account for potentially harmful contaminants which might be found in native soil and rock. Therefore some materials are exempt from classification under the policy because their chemical, physical, or aesthetic properties make them unsuitable as fill material.

As a primary focus of the Ministry of the Environment's waste management approach, we are encouraging 3Rs -- reduction, reuse, and recycling. It is not desirable to create new low cost disposal options for materials which have a potential for a 3Rs management. Therefore, some materials are excluded from classification under the policy to complement 3Rs initiatives. Figure III - 1 graphically displays the recommended decision tree for generators of waste to follow in deciding on an appropriate management approach.

Examples of Materials Suitable for Classification and Potential Management as Fill

soil
rock
surplus aggregate
ash
slag
concrete
brick/mortar
foundry sand
cement or lime kiln dust
mine tailings
mine rockspent blast media
catch basin cleanout material
road sweepings

Examples of Materials Not Suitable for Classification and Management as Fill

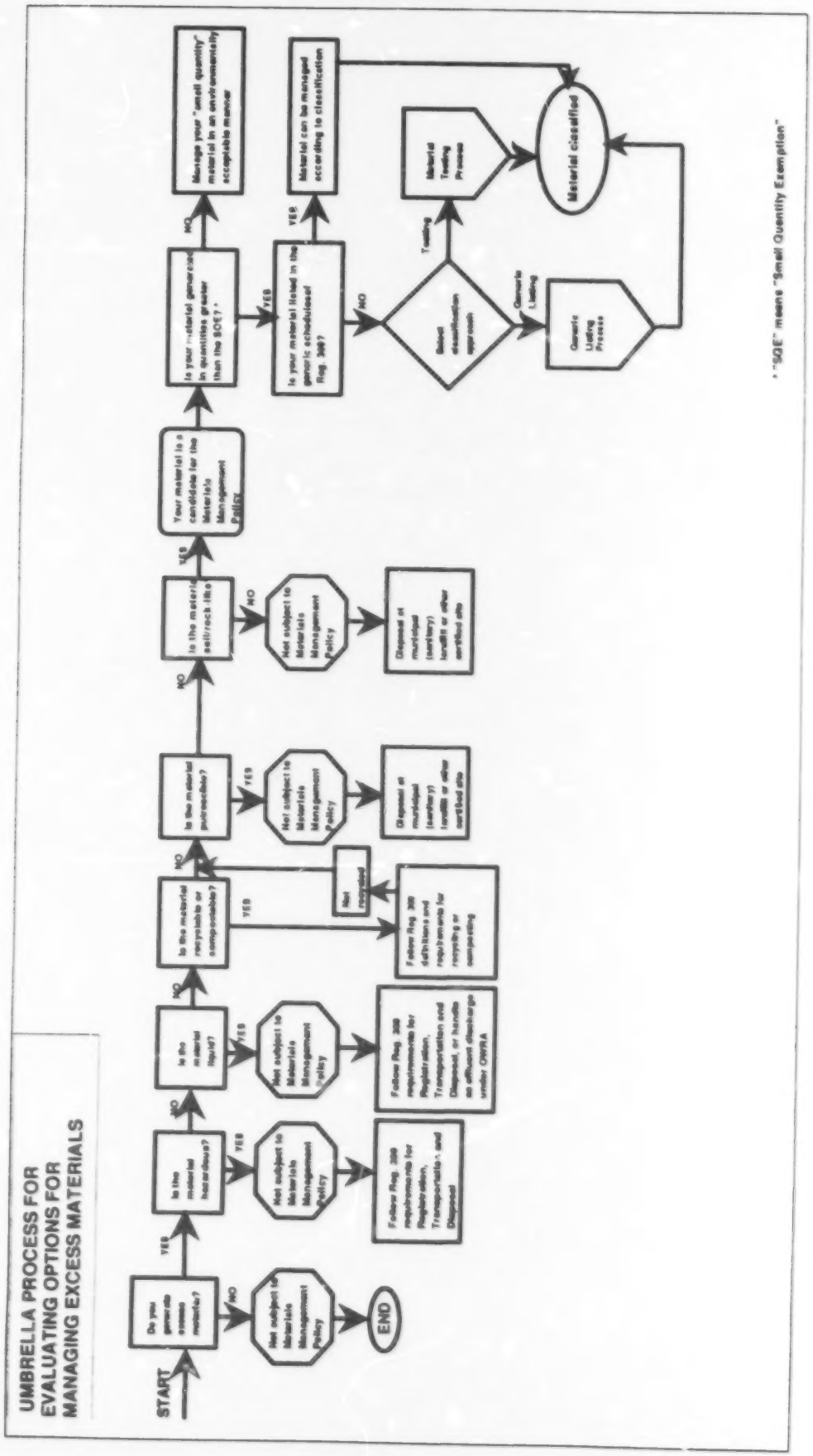
hazardous waste (defined in Reg. 309)
liquid waste
organic sludge
sewage sludge
asbestos
wood
clearing and grubbing waste
food waste

3R exclusion*
glass
asphalt
asphalt shingles
paper
plastic
rubber
textiles
metal
broken ceramics
compostable waste

The foregoing lists are presented for discussion purposes. Comment is sought on additions and deletions, with explanations for the proposed modifications. This input will be useful in finalizing the list of explicit inclusions and exclusions to be included in the policy and regulatory amendments.

* Some of these materials may be acceptable for use as recyclable material in "engineered construction applications", if they cannot be reused or recycled in value-added products. These rules are now under development by the Waste Reduction Office, Ministry of the Environment.

FIGURE III - 1


UMBRELLA PROCESS FOR
EVALUATING OPTIONS FOR
MANAGING EXCESS MATERIALS
START
Do you generate excess materials?
NO
Not subject to Materials Management Policy
END
YES
Is the material hazardous?
YES
Not subject to Materials Management Policy
Follow Reg. 200 requirements for Registration, Transportation, and Disposal
NO
Is the material liquid?
YES
Not subject to Materials Management Policy
Follow Reg. 200 requirements for Registration, Transportation and Disposal, or handle as effluent discharge under CWA/A
NO
Is the material recyclable or composable?
YES
Not complying
Follow Reg. 200 definitions and requirements for recycling or composting
NO
Is the material putrescible?
YES
Not subject to Materials Management Policy
Dispose at municipal (sanitary) landfill or other certified site
NO
Is the material soil/rock like
NO
Not subject to Materials Management Policy
Dispose at municipal (sanitary) landfill or other certified site
YES
Your material is a candidate for the Materials Management Policy
Is your material generated in quantities greater than the SQE?*
YES
Is your material listed in the generic schedules of Reg. 200?
NO
Select classification approach
Testing
Generic Listing
Material Testing Process
Generic Listing Process
YES
Material can be managed according to classification
NO
Manage your "small quantity" material in an environmentally acceptable manner
Material classified
* "SQE" means "Small Quantity Exemption"